Mr. Dave Sulc
Nucor Steel
P.O. Box 249
Waupaca, WI 54981

Re: Significant Source Modification No:
107-12143-00038

Dear Mr. Sulc:

Nucor Steel applied for a Part 70 operating permit on November 14, 1996 for a steel mill. An application to modify the source was received on April 11, 2000. Pursuant to 326 IAC 2-7-10.5 the following emission units are approved for construction at the source:

(a) A strip caster line rated at a maximum steel production rate of 135 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of 99 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted through the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of 98 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted though the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strips from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strips;

(4) Descaling operations utilizing water to remove scale from the steel strip;

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 135 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product

from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2 and one (1) natural gas-fired ladle dryer identified as LD-1. Each ladle preheater and dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 6 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(3) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1.0 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(4) Two (2) natural gas-fired tundish dryers identified as TD-1 and TD-2. Each tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 9 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21; and

(5) Natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and not exceed a total heat input capacity of 15 MMBtu per hour. These preheaters shall be used in the tundish operations.

(c) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS baghouse dust loading silo equipped with a bin vent filter, or equivalent, for material recovery and particulate matter control. The emissions from the LMS dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with a maximum water flow rate of 12,000

gallons per minute and one (1) noncontact cooling tower system with a maximum water flow rate of 12,000 gallons per minute; and

(5) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations.

(d) One (1) additional natural gas-fired ladle preheater to the existing meltshop, identified as LP-4. This preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input capacity of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. The existing melt shop building will also be expanded in size, there is no emission increase due to this building expansion.

(e) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill building and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(f) Eighteen (18) natural gas-fired batch annealing furnaces, utilizing propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

The Significant Source Modification approval will be incorporated into the pending Part 70 permit application pursuant to 326 IAC 2-7-10.5(l)(3). If there are no changes to the proposed construction of the emission units, the source may begin operating on the date that IDEM receives an affidavit of construction pursuant to 326 IAC 2-7-10.5(h). If there are any changes to the proposed construction the source can not operate until an Operation Permit Validation Letter is issued.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter call (800) 451-6027, press 0 and ask for Nisha Sizemore or extension 2-8356, or dial (317) 232-8356.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments
nls
cc: File - Montgomery County
U.S. EPA, Region V
Montgomery County Health Department
Air Compliance Section Inspector - Richard Sekula
Compliance Data Section - Karen Nowak
Administrative and Development - Janet Mobley
Technical Support and Modeling - Michele Boner

PART 70 SIGNIFICANT SOURCE MODIFICATION
and
PREVENTION OF SIGNIFICANT DETERIORATION
OFFICE OF AIR QUALITY

Nucor Steel
RR 2, Box 311, County Road 400 East
Crawfordsville, Indiana 47933

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this approval.

This approval is issued in accordance with 326 IAC 2-1.1, 326 IAC 2-2, 40 CFR 52.780 and 40 CFR 124, and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Source Modification No.: 107-12143-00038	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date:

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SECTION A SOURCE SUMMARY

This approval is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the emission units contained in conditions A.1 through A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this approval pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a steel mill.

Responsible Official:	John J. Ferriola
Source Address:	RR 2, Box 311, County Road 400 East, Crawfordsville, IN 47933
Mailing Address:	RR 2, Box 311, County Road 400 East, Crawfordsville, IN 47933
Phone Number:	765-364-1323
SIC Code:	3312
County Location:	Montgomery
County Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Permit Program Major Source under PSD Major Source pursuant to Section 112 of the Clean Air Act One of 28 Listed Categories

A.2 Emission Units and Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source is approved to construct and operate the following emission units and pollution control devices:

(a) A strip caster line rated at a maximum steel production rate of 135 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of 99 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted through the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of 98 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted though the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strips from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strips;

(4) Descaling operations utilizing water to remove scale from the steel strip;

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 135 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2 and one (1) natural gas-fired ladle dryer identified as LD-1. Each ladle preheater and dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 6 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

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(5) Natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and not exceed a total heat input capacity of 15 MMBtu per hour. These preheaters shall be used in the tundish operations.

(c) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS baghouse dust loading silo equipped with a bin vent filter, or equivalent, for material recovery and particulate matter control. The emissions from the LMS dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with a maximum water flow rate of 12,000 gallons per minute and one (1) noncontact cooling tower system with a maximum water flow rate of 12,000 gallons per minute; and

(5) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations.

(d) One (1) additional natural gas-fired ladle preheater to the existing meltshop, identified as LP-4. This preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input capacity of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. The existing melt shop building will also be expanded in size, there is no emission increase due to this building expansion.

(e) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill building and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(f) Eighteen (18) natural gas-fired batch annealing furnaces, utilizing propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to

be installed as described above.

A.3 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because it is a major source, as defined in 326 IAC 2-7-1(22).

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 General Construction Conditions

(a) This approval is based on the data and information submitted by the Permittee. Any change in the design or operation of the plant that could increase emissions or change applicable air pollution control requirements may require that the approval be amended in accordance with 326 IAC 2 as set forth in condition B.5 of this approval.

(b) This approval to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

(c) Notwithstanding Construction Condition B.5, all requirements and conditions of this approval shall remain in effect unless modified in a manner consistent with procedures established for modifications pursuant to 326 IAC 2 (Permit Review Rules).

(d) When the facility is constructed and placed into operation, the operation conditions required by Section C and Section D shall be met.

B.2 Definitions [326 IAC 2-7-1]

Terms in this approval shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, any applicable definitions found in IC 13-11, 326 IAC 1-2 and 326 IAC 2-7 shall prevail.

B.3 Effective Date of the Permit

Pursuant to 40 CFR Parts 124.15, 124.19 and 124.20, the effective date of this approval will be thirty (30) days from its issuance if comments are received. Three (3) days shall be added to the thirty (30) day period, if service of notice is by mail. If no public comments are received, then the approval shall be effective immediately upon issuance.

B.4 Revocation of Permits [326 IAC 2-2-8]

Pursuant to 326 IAC 2-2-8(a)(1), the Commissioner may revoke this approval if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of eighteen (18) months or more.

B.5 Significant Source Modification [326 IAC 2-7-10.5(h)]

This document shall also become the approval to operate pursuant to 326 IAC 2-7-10.5(h) when, prior to start of operation, the following requirements are met:

(a) The attached affidavit of construction shall be submitted to the Office of Air Quality (OAQ), Permit Administration & Development Section, verifying that the emission units were constructed as proposed in the application. The emissions units covered in the Significant Source Modification approval may begin operating on the date the affidavit of construction is postmarked or hand delivered to IDEM if constructed as proposed.

(b) If actual construction of the emissions units differs from the construction proposed in the application, the source may not begin operation until the source modification has been revised pursuant to 326 IAC 2-7-11 or 326 IAC 2-7-12 and an Operation Permit Validation

Letter is issued.

(c) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.

(d) The Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.

(e) In the event that the Title V application is being processed at the same time as this application, the following additional procedures shall be followed for obtaining the right to operate:

(1) If the Title V draft permit has not gone on public notice, then the change/addition covered by the Significant Source Modification will be included in the Title V draft.

(2) If the Title V permit has gone thru final EPA proposal and would be issued ahead of the Significant Source Modification, the Significant Source Modification will go thru a concurrent 45 day EPA review. Then the Significant Source Modification will be incorporated into the final Title V permit at the time of issuance.

(3) If the Title V permit has not gone thru final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Title V permit, and the Title V permit will issued after EPA review.

B.6 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation, except as provided in 326 IAC 2-7-16.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a health-based or technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency,

or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or
Telephone Number: 317-233-5674 (ask for Compliance Section)
Facsimile Number: 317-233-5967

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) IDEM, OAQ, may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(10) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ, by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) Operations may continue during an emergency only if the following conditions are met:

(1) If the emergency situation causes a deviation from a technology-based limit, the

Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

(2) If an emergency situation causes a deviation from a health-based limit, the Permittee may not continue to operate the affected emissions facilities unless:

(A) The Permittee immediately takes all reasonable steps to correct the emergency situation and to minimize emissions; and

(B) Continued operation of the facilities is necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value.

Any operation shall continue no longer than the minimum time required to prevent the situations identified in (g)(2)(B) of this condition.

SECTION C GENERAL OPERATION CONDITIONS

C.1 Certification [326 IAC 2-7-4(f)] [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)(C)]

(a) Where specifically designated by this approval or required by an applicable requirement, any application form, report, or compliance certification submitted under this approval shall contain certification by a responsible official of truth, accuracy, and completeness. This certification, shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) One (1) certification shall be included, on the attached Certification Form, with each submittal.

(c) A responsible official is defined at 326 IAC 2-7-1(34).

C.2 Preventive Maintenance Plan [326 IAC 2-7-5(1),(3) and (13)] [326 IAC 2-7-6(1) and (6)] [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) upon operation. The PMP shall include the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee's control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) The Permittee shall implement the PMPs as necessary to ensure that failure to implement a PMP does not cause or contribute to a violation of any emissions limitation.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ, upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or contributes to any violation. The PMP does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(d) Records of preventive maintenance shall be retained for a period of at least five (5) years. These records shall be kept at the source location for a minimum of three (3) years. The

records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

C.3 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this approval.

(b) Any application requesting an amendment or modification of this approval shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

Any such application should be certified by the "responsible official" as defined by 326 IAC 2-7-1(34) only if a certification is required by the terms of the applicable rule

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

C.4 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this approval:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.5 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute, rule, or in this approval, all air pollution control equipment listed in this approval and used to comply with an applicable requirement shall be operated at all times that an emission unit vented to a pollution control device is in operation.

C.6 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted by using good engineering practices (GEP) pursuant to 326 IAC 1-7-3. The provisions of 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4(d)(3), (e), and (f), and 326 IAC 1-7-5(d) are not federally enforceable.

Testing Requirements [326 IAC 2-7-6(1)]

C.7 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

(b) All test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by the IDEM, OAQ if the source submits to IDEM, OAQ, a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

The documentation submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

C.8 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

All monitoring and record keeping requirements shall be implemented upon startup. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

C.9 Maintenance of Emission Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the emission monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem. To the extent practicable, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less frequent than required in Section D of this permit until such time as the monitoring equipment is back in operation. In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less often than once an hour until such time as the continuous monitor is back in operation.

(b) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.

C.10 Maintenance of Opacity Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the continuous opacity monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.

(b) In the case of continuous opacity monitoring, whenever the continuous opacity monitor is malfunctioning or will be down for repairs or adjustments for a period of four (4) hours or more, visible emission readings should be performed in accordance with 40 CFR 60, Appendix A, Method 9, beginning four (4) hours after the start of the malfunction or down time for a minimum of one (1) hour.

(c) If the reading period begins less than one hour before sunset, readings shall be performed until sunset. If the first required reading period would occur between sunset and sunrise, the first reading shall be performed as soon as there is sufficient daylight.

(d) Method 9 opacity readings shall repeated for a minimum of one (1) hour at least once every four (4) hours during daylight operations, until such time that the continuous opacity monitor is back in operation.

(e) The opacity readings during this period shall be reported in the quarterly Compliance Monitoring Reports, unless there are ANY observed six minute averaged exceedances, in which case, these shall be reported to the air compliance inspector within four (4) working hours.

(f) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary opacity monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.

C.11 Gauge and Other Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) Whenever a condition in this permit requires the measurement of pressure drop across any part of the unit or its control device, the gauge employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

(b) Whenever a condition in this permit requires the measurement of a fan amperage, the instrument employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

Corrective Actions and Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

C.12 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 2-7-5][326 IAC 2-7-6] [326 IAC 1-6]

(a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. The compliance monitoring plan can be either an entirely new document, consist in whole of information contained in other documents, or consist of a combination of new information and information contained in other

documents. If the compliance monitoring plan incorporates by reference information contained in other documents, the Permittee shall identify as part of the compliance monitoring plan the documents in which the information is found. The elements of the compliance monitoring plan are:

(1) This condition;

(2) The Compliance Determination Requirements in Section D of this approval;

(3) The Compliance Monitoring Requirements in Section D of this approval;

(4) The Record Keeping and Reporting Requirements in Section C (Monitoring Data Availability, General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this approval; and

(5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this approval. CRPs shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The Permittee shall prepare and implement the CRPs upon operation, as defined in Condition C.5. The CRPs are comprised of:

(A) Reasonable response steps that may be implemented in the event that compliance related information indicates that a response step is needed pursuant to the requirements of Section D of this approval; and

(B) A time schedule for taking reasonable response steps including a schedule for devising additional response steps for situations that may not have been predicted.

(b) For each compliance monitoring condition of this permit, reasonable response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to take reasonable response steps may constitute a violation of the permit.

(c) Upon investigation of a compliance monitoring excursion, the Permittee is excused from taking further response steps for any of the following reasons:

(1) A false reading occurs due to the malfunction of the monitoring equipment. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.

(2) The Permittee has determined that the compliance monitoring parameters established in the approval conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the approval, and such request has not been denied;

(3) An automatic measurement was taken when the process was not operating;

(4) The process has already returned or is returning to operating within “normal” parameters and no response steps are required.

(d) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken. In the event of an emergency, the provisions of 326 IAC 2-7-16 (Emergency Provisions) requiring prompt corrective action to mitigate emissions shall prevail.

(e) All monitoring required in Section D shall be performed at all times the equipment is operating. If monitoring is required by Section D and the equipment is not operating, then the Permittee may record the fact that the equipment is not operating or perform the required monitoring.

(f) At its discretion, IDEM may excuse the Permittee's failure to perform the monitoring and record keeping as required by Section D, if the Permittee provides adequate justification and documents that such failures do not exceed five percent (5%) of the operating time in any quarter. Temporary, unscheduled unavailability of qualified staff shall be considered a valid reason for failure to perform the monitoring or record keeping requirements in Section D.

C.13 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.

(b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The documents submitted pursuant to this condition do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.14 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6]

(a) Records of all required data, reports and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, all record keeping requirements not already legally required shall be implemented upon startup.

C.15 General Reporting Requirements [326 IAC 2-7-5(3)(C)]

(a) The reports required by conditions in Section D of this approval shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) Unless otherwise specified in this approval, any notice, report, or other submission required by this approval shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) Unless otherwise specified in this approval, any quarterly report shall be submitted within thirty (30) days of the end of the reporting period. The reports do require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(d) The first report shall cover the period commencing on the date of issuance of this approval and ending on the last day of the reporting period.

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(a) A strip caster line rated at a maximum steel production rate of 135 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of 99 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted through the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of 98 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted though the LMS baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strip from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strip;

(4) Descaling operations utilizing water to remove scale from steel strip; and

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 135 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.1.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall comply with the following requirements.

(1) The ladles associated with the strip caster shall be covered with lids which shall be closed at all times when transporting molten metal in the ladles, in order to minimize uncontrolled emissions.

(2) The LMS shall be equipped with a side draft hood that evacuates particulate fumes from the LMS to the LMS baghouse. The side draft hood shall have a minimum capture efficiency of 99 percent.

(3) The tundish and continuous strip caster shall be controlled by a canopy hood that evacuates particulate fumes to the LMS baghouse. The hood shall have a minimum capture efficiency of 98 percent.

(4) The filterable PM/PM_{10} emissions from the LMS baghouse shall not exceed 0.0018 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(5) The filterable and condensible PM/PM_{10} emissions from the LMS baghouse shall not exceed 0.0052 gr/dscf at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(6) The opacity from the LMS baghouse stack (S-20) and the LMS roof monitor (S-21) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations, the filterable PM emissions from the strip caster process line shall not exceed 54.3 pounds per hour when operating at the maximum process weight rate of 135 tons of steel per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11} - 40$ where: E = Rate of emissions in pounds per hour; and P = Process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of 60,000 pounds per hour.

D.1.2 Nitrogen Oxide (NOx) Emission Limitation

Pursuant to 326 IAC 2-2 (PSD Requirements), the LMS shall not exceed 0.0176 pounds NOx per ton of steel produced.

D.1.3 Carbon Monoxide (CO) Emission Limitation

Pursuant to 326 IAC 2-2 (PSD Requirements), the LMS shall not exceed 0.07125 pound of CO per ton of steel produced and 9.62 pounds of CO per hour.

D.1.4 Sulfur Dioxide (SO2) Emission Limitation

Pursuant to 326 IAC 2-2 (PSD Requirements), the LMS shall not exceed 0.185 pounds SO2 per ton of steel produced.

D.1.5 Lead (Pb) Emission Limitation

To avoid the requirements of 326 IAC 2-2 (PSD Requirements), the LMS shall not exceed 0.136 pound of Pb per hour.

D.1.6 Operation Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall not exceed a maximum steel throughput of 135 tons per hour. The Permittee shall demonstrate compliance with this production limit based on a consecutive 12-month period.

D.1.7 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the particulate capture and control systems associated with the LMS, tundish and continuous strip caster.

Compliance Determination and Monitoring

D.1.8 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform filterable and condensible PM/PM_{10} , NOx, CO, SO2, and Pb compliance stack tests for the LMS baghouse stack (S-20) within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity compliance stack tests for the LMS baghouse stack (S-20) and the LMS roof monitor (S-21) within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the LMS baghouse stack, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) All compliance stack tests shall be repeated at least annually until such time that the Part 70 permit for this source is in effect.

(e) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.1.9 Visible Emissions Notations

(a) Daily visible emission notations of the LMS baghouse stack exhaust shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

D.1.10 Parametric Monitoring for the Baghouse, Side Draft Hood, and Canopy Hood

(a) The Permittee shall record the total static pressure drop across the LMS baghouse, at least once per shift when the associated LMS or continuous strip caster is in operation. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 2.0 and 8.0 inches of water or a range established during the most recent compliant stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the pressure reading is outside of the above-mentioned range for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

The instrument used for determining the pressure shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

(b) The Permittee shall record the fan amperes of LMS baghouse fan at least once per shift. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the fan amperes of the capture and control system shall be maintained within plus or minus 15% of the rate established during the most recent compliant stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the fan amperes are more than 15% above or below the above-mentioned rate for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

The instrument used for determining the fan amperes shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

D.1.11 Baghouse Inspections

An inspection of the LMS baghouse bags shall be performed each calendar quarter and all defective bags replaced. A record shall be kept of the results of the inspection and the number of bags replaced.

D.1.12 Broken or Failed Bag Detection

In the event that bag failure has been observed:

(a) The affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Compliance Response Plan shall be initiated.

For any failure with corresponding response steps and timetable not described in the Compliance Response Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(b) For single compartment baghouses, failed units and the associated process will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

Recordkeeping and Reporting Requirements

D.1.13 Recordkeeping Requirement

(a) The Permittee shall maintain records of the performance tests required by Operation Condition D.1.8 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.9, D.1.10, D.1.11, and D.1.12 to demonstrate compliance with Operation Condition D.1.1.

D.1.14 Reporting Requirements

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.1.8 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) A quarterly summary of the information to document compliance with Condition D.1.6 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported. These reports require a certification by the responsible official.

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(b) Combustion equipment associated with the strip caster plant:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2 and one (1) natural gas-fired ladle dryer identified as LD-1. Each ladle preheater and dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 6 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(3) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(4) Two (2) natural gas-fired tundish dryers identified as TD-1 and TD-2. Each tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 9 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21; and

(5) Natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and not exceed a total heat input capacity of 15 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.2.1 Nitrogen Oxides (NO_X) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned combustion units shall comply with the following requirements:

(1) Each combustion facility shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel; and

(2) The combustion facilities shall comply with the following:

Combustion Facility	No. Units	Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	NOx Emission Limit (lb NOx/MMBtu)
Ladle Preheater	2	15	Low-NOx	0.10
Ladle Dryer	1	15	Low-NOx	0.10
Tundish Preheater	2	6	Oxy-Fuel	0.15
Tundish Nozzle Preheater	2	1	Low-NOx	0.10
Tundish Dryer	2	9	Low-NOx	0.10
Transition Piece Preheaters	1	15 (Total)	Low-NOx	0.10

D.2.2 Particulate (PM and PM_{10}), Carbon Monoxide (CO), and Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned combustion units shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel.

Compliance Determination and Monitoring

D.2.3 Performance Testing

Testing of the above-mentioned facilities is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

D.2.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) all vendor guarantees of the above-mentioned combustion units to demonstrate compliance with Operation Conditions D.2.1(a)(1) and (2).

Recordkeeping and Reporting Requirements

D.2.5 Recordkeeping Requirement

The Permittee shall maintain records of the parameters stated in Operation Condition D.2.4 to demonstrate compliance with Operation Condition D.2.1(a)(1) and (2).

SECTION D.3 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(c) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS baghouse dust loading silo equipped with a bin vent filter, or equivalent, for material recovery and particulate matter control. The emissions from the LMS dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with a maximum water flow rate of 12,000 gallons per minute and one (1) noncontact cooling tower system with a maximum water flow rate of 12,000 gallons per minute; and

(5) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.3.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the LMS baghouse dust loading silo shall comply with the following requirements:

(1) The LMS baghouse dust loading silo shall be equipped with a bin vent;

(2) The filterable PM/PM_{10} emissions from the LMS baghouse dust loading silo shall not exceed 0.01 gr/dscf at a maximum volumetric air flow rate of 100 standard cubic feet per minute; and

(3) The opacity from the LMS baghouse dust loading silo shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the emissions from dumping, storage, and transfer operations of raw materials shall not exceed five percent (5%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1

(Opacity Limitations).

(c) Pursuant to 326 IAC 2-2 (PSD Requirements), the paved surface silt loading shall not exceed 16.8 pounds of silt per mile and the average instantaneous opacity from paved roadways and parking lots shall not exceed ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway.

(d) Pursuant to 326 IAC 2-2 (PSD Requirements), the visible emissions from unpaved roadways and unpaved areas around raw material storage piles shall not exceed an average instantaneous opacity of ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the unpaved roadway.

(e) Pursuant to 326 IAC 2-2 (PSD Requirements), the two (2) cooling towers shall be equipped with drift eliminators to minimize particulate emissions. The noncontact cooling tower shall not exceed a water flow rate of 12,000 gallons of water per minute, and the contact cooling tower shall not exceed a water flow rate of 12,000 gallons of water per minute.

D.3.2 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of

this permit, is required for the bin vent filter to the LMS baghouse dust loading silo.

Compliance Determination and Monitoring

D.3.3 Performance Testing

Testing of the above-mentioned facilities is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

D.3.4 Visible Emissions Notations

(a) Weekly visible emission notations of the bin vent to the LMS baghouse dust loading silo shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

D.3.5 Bin Vent Filter Inspections

An inspection of the bin vent filter to the LMS baghouse silo shall be performed each calendar quarter. A defective filter shall be replaced and a record shall be kept of the results of the inspection.

D.3.6 Broken or Failed Bin Vent Filter Detection

In the event that filter failure of the bin vent has been observed, the failed unit and its associated process will be shut down immediately until the failed unit have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

Recordkeeping and Reporting Requirements

D.3.7 Recordkeeping Requirement

The Permittee shall maintain records of the parameters stated in Operation Conditions D.3.4,

D.3.5, and D.3.6 to demonstrate compliance with PSD requirements.

SECTION D.4 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(d) One (1) additional natural gas-fired ladle preheater to the existing meltshop, identified as LP-4. This preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input capacity of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. The existing melt shop building will also be expanded in size, there is no emission increase due to this building expansion.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.4.1 Nitrogen Oxides (NO_X) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned additional ladle preheater to the existing LMS shall comply with the following requirements:

(a) The ladle preheater shall be equipped with low-NOx burners;

(b) The ladle preheater shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel; and

(c) The NOx emissions from the ladle preheater shall not exceed 0.10 pounds per MMBtu.

D.4.2 Particulate (PM and PM_{10}), CO, and Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned additional ladle preheater to the existing LMS shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel.

Compliance Determination and Monitoring

D.4.3 Performance Testing

Testing of the above-mentioned facilities is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

D.4.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantee for the above-mentioned ladle preheater to demonstrate compliance with Operation Conditions D.4.1(a) and (c).

SECTION D.5 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(e) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.5.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the continuous blasting unit shall comply with the following requirements:

(1) The continuous blasting unit shall be equipped with one (1) cyclone for product recovery and one (1) baghouse for particulate matter control;

(2) The filterable and condensibles PM/PM_{10} emissions from the continuous blasting unit baghouse shall not exceed 0.003 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 36,000 standard cubic feet per minute;

(3) The opacity from the cold mill building containing the continuous blasting unit baghouse shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the storage silo shall comply with the following requirements:

(1) The storage silo shall be equipped with one (1) bin vent for product recovery and particulate matter control;

(2) The filterable PM/PM_{10} emissions from the storage silo bin vent shall not exceed 0.01 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 1,000 standard cubic feet per minute; and

(3) The opacity from the cold mill building containing the storage silo bin vent shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(c) Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations, the filterable PM emissions from the continuous blasting system shall not exceed 48.6 pounds per hour when operating at the maximum process weight rate of 75 tons of steel per hour and blasting rate of 1 ton per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11} - 40$ where: E = Rate of emissions in pounds per hour; and P = Process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of 60,000 pounds per hour.

D.5.2 Operation Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), it is prohibitive to utilize the pickle line and the continuous blasting system in a parallel arrangement.

D.5.3 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the cyclone and baghouse to the continuous blasting unit and for the bin vent filter to the storage silo.

Compliance Determination and Monitoring:

D.5.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform filterable and condensible PM/PM10 compliance stack tests for the continuous blasting unit stack (S-22) within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity tests of the Cold Mill building while the continuous blasting unit is operating within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the continuous blasting unit, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.5.5 Visible Emissions Notations

(a) Weekly visible emission notations of the baghouse stack to the continuous blasting unit and the bin vent to the silo shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

D.5.6 Parametric Monitoring

The Permittee shall record the total static pressure drop across the baghouse to the continuous blasting unit at least once per shift when the associated blasting process is in operation. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 4.0 and 10.0 inches of water or a range established during the most recent compliant stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the pressure reading is outside of the above mentioned range for any one reading.
The instrument used for determining the pressure shall comply with Condition C.10 (Pressure Gauge and Other Instrument Specifications) of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

D.5.7 Baghouse and Bin Vent Filter Inspections

An inspection of the bin vent filter to the silo and the baghouse to the continuous blasting unit shall be performed each calendar quarter. Defective bag(s) and filter(s) shall be replaced. The Permittee shall keep records of the results of the inspection.

D.5.8 Broken or Failed Bin Vent Filter Detection

(a) In the event that filter failure of the bin vent has been observed, the failed unit and its associated process will be shut down immediately until the failed unit have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(b) In the event that bag failure in the baghouse has been observed, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Compliance Response Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

Recordkeeping and Reporting Requirements

D.5.9 Recordkeeping Requirement

The Permittee shall maintain records of the parameters required by Operation Conditions D.5.4, D.5.5, D.5.6, D.5.7, and D.5.8 to demonstrate compliance with PSD requirements.

D.5.10 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Conditions D.5.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.5.1(a)(2) and (3).

SECTION D.6 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(f) Eighteen (18) natural gas-fired batch annealing furnaces, utilizing propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.6.1 Nitrogen Oxides (NO_X) and CO Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the eighteen (18) batch annealing furnaces shall comply with the following requirements:

(a) Each batch annealing furnace shall be equipped with low-NOx burners;

(b) Each batch annealing furnace shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel;

(c) The NOx emissions from each batch annealing furnace shall not exceed 0.10 pounds per MMBtu; and

(d) The CO emissions from each batch annealing furnace shall not exceed 0.084 pound per MMBtu.

D.6.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned additional batch annealing furnaces shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel.

Compliance Determination and Monitoring

D.6.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform NOx and CO compliance stack tests on at least four (4) batch annealing furnaces within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(b) All compliance stack tests shall be repeated at least annually until such time that the Part 70 permit for this source is in effect.

(c) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.6.5 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantees for the above-mentioned batch annealing furnaces to demonstrate compliance with Operation Conditions D.6.1(a), (c), and (d).

Recordkeeping and Reporting Requirements

D.6.6 Recordkeeping Requirement

The Permittee shall maintain records of the parameters required by Operation Conditions D.6.4 and D.6.5 to demonstrate compliance with Operation Condition D.6.1.

D.6.7 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.6.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Condition D.6.1(c) and (d).

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

PART 70 SOURCE MODIFICATION CERTIFICATION

Source Name: Nucor Steel
Source Address: RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Mailing Address: RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Source Modification No.: 107-12143-00038

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this approval.

Please check what document is being certified:

9 Test Result (specify) _____

9 Report (specify) _____

9 Notification (specify) _____

9 Affidavit (specify) _____

9 Other (specify) _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Date:

A certification by the responsible official must be submitted with this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Reporting Form

Source Name:	Nucor Steel
Source Address:	RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Mailing Address:	RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Source Modification No.:	107-12143-00038
Facility:	Strip Caster Line
Parameter:	Steel Production Limitation
Limit:	135 tons per hour (Compliance Demonstrated by 1,182,600 ton steel production per year limit, based on a consecutive 12-month period

YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY

COMPLIANCE BRANCH
P.O. Box 6015
100 North Senate Avenue
Indianapolis, Indiana 46206-6015
Phone: 317-233-5674
Fax: 317-233-5967

PART 70 OPERATING PERMIT
EMERGENCY OCCURRENCE REPORT

Source Name:	Nucor Steel
Source Address:	RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Mailing Address:	RR2, Box 311, County Road 400 East, Crawfordsville, Indiana 47933
Source Modification No.:	107-12143-00038

This form consists of 2 pages **Page 1 of 2**

9 This is an emergency as defined in 326 IAC 2-7-1(12)

- C The Permittee must notify the Office of Air Quality (OAQ), within four (**4**) business hours (1-800-451-6027 or 317-233-5674, ask for Compliance Section); and
- C The Permittee must submit notice in writing or by facsimile within two (**2**) days (Facsimile Number: 317-233-5967), and follow the other requirements of 326 IAC 2-7-16.

If any of the following are not applicable, mark N/A

Facility/Equipment/Operation:
Control Equipment:
Permit Condition or Operation Limitation in Permit:
Description of the Emergency:

Describe the cause of the Emergency:

If any of the following are not applicable, mark N/A **Page 2 of 2**

Date/Time Emergency started:
Date/Time Emergency was corrected:
Was the facility being properly operated at the time of the emergency? Y N Describe:
Type of Pollutants Emitted: TSP, PM-10, SO_2, VOC, NO_X, CO, Pb, other:
Estimated amount of pollutant(s) emitted during emergency:
Describe the steps taken to mitigate the problem:
Describe the corrective actions/response steps taken:
Describe the measures taken to minimize emissions:
If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value:

Form Completed by: _____

Title / Position: _____

Date: _____

Phone: _____

A certification is not required for this report.

Indiana Department of Environmental Management
Office of Air Quality

Addendum to the
Technical Support Document for a Significant Source Modification
to a Part 70 Operating Permit

Source Name:	Nucor Steel
Source Location:	Route 2, Box 311, Crawfordsville, Indiana 47933
County:	Montgomery
SIC Code:	3312
Operation Permit No.:	107-7172-00038
Operation Permit Issuance Date:	Not Yet Issued
Significant Source Modification No.:	107-12143-00038
Permit Reviewers:	Michele M. Williams and Nisha Sizemore

On October 20, 2000, the Office of Air Quality (OAQ) had a notice published in The Journal Review, Crawfordsville, Indiana, stating that Nucor Steel had applied for a significant source modification to a Part 70 Operating Permit to operate the proposed strip caster annealing furnaces plant and other miscellaneous modifications to the existing pickle line, meltshop, and continuous caster line. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed. A public hearing was also held on November 20, 2000.

During the public comment period, it was discovered that CO emissions should also be analyzed and reviewed under the PSD program. Therefore, the CO emissions were reviewed pursuant to the PSD Program (326 IAC 2-2 and 40 CFR 52.21) and a second notice was published on December 2, 2000 in The Journal Review, Crawfordsville, Indiana. This second notice served as the public notification for the BACT and air quality analysis for CO emissions for the proposed modification. A second public hearing was also held on January 4, 2001.

On November 20, 2000 and December 29, 2000, Stephen A. Loeschner submitted comments on the proposed significant source modification to the Part 70 permit. A summary of the comments is as follows:

Comment #1

Nov 20, 2000 comment:

What are the allowable lead and lead compound stack and fugitive emissions from this entire source prior to this modification? What are they after this modification? What are the allowable PM and PM10 stack and fugitive emissions from this entire source prior to this modification? What are they after this modification? Even though it seems clear that permitted lead emissions have exceeded 0.6 tons per year for some time, there is no lead data in the table on page 6 of the technical support document (TSD).

Response #1

IDEM now believes that the existing source allowable emissions prior to this proposed modification as shown on page 6 of the TSD were incorrect. IDEM has reviewed Nucor's prior permits and determined that the existing source allowable emissions before and after the modification are as follows (shown in the table below). The allowable emissions from this modification have also been revised due to other corrections made to the calculations (see pages 20 and 21 for a detailed description of these corrections). Both the original and revised values are shown in the table below. The table now also includes the lead emissions as well as the total source allowable emissions after this proposed modification.

Pollutant	Existing Source Emissions (tons/year)	Allowable Emissions from this Modification (tons/year)	Total Source Allowable Emissions after this Modification (tons/year)
PM	~~178~~ **259.3**	~~46.3~~ **73.9**	**333.2**
PM-10	~~135~~ **247.6**	~~28.2~~ **61.9**	**309.5**
SO2	~~222~~ **798.6**	~~112~~ **111.0**	**909.6**
VOC	~~261~~ **335.2**	~~12.3~~ **9.7**	**344.9**
CO	~~9755~~ **4647.1**	~~120~~ **113.7**	**4760.8**
NOx	~~14,748~~ **1538.2**	~~124.5~~ **97.7**	**1635.9**
lead	**0.7**	~~0.20~~ **0.014**	**0.714**

Comment #2

Nov 20, 2000 comment:

Has BACT ever been required for the lead emissions from Nucor Steel? Why not? If increases less than 0.6 tons per year are lawfully permitted to cumulate over several years, is there any point where BACT for lead may be lawfully required? Could the Nucor facility grow to a 2.4 tons per year lead emitter and have no BACT requirement?

Response #2

The Prevention of Significant Deterioration (PSD) rules are set up such that each individual modification at a source is reviewed separately to determine PSD applicability. IDEM has issued several permits to Nucor since 1989. Some of these permits required PSD BACT for particulate matter, but none of them required PSD BACT specifically for lead emissions. This is because the potential to emit (PTE) lead from each modification was less than 0.6 tons per year, which is the PSD applicability threshold level for lead emissions. When a source submits more than one application within a short time period (typically within the same 18 month period), IDEM does review the applications to determine if they should be combined and reviewed as a single modification. In this case, Nucor had submitted three separate permit applications requesting three separate minor source modification permits. IDEM reviewed the applications and determined that they should be considered a single modification; therefore IDEM combined them and reviewed the three proposed projects as a single major source modification, requiring PSD review.

Even though BACT has never been required for lead, BACT level controls for particulate matter have been required to be installed on the meltshop operations. IDEM has found that generally, BACT level controls for

lead are consistent with BACT level controls for particulate matter for these types of sources. Regardless of whether PSD BACT is required, IDEM cannot allow levels of pollutants to be emitted which would cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS), which have been established by the EPA in order to protect public health. Even though BACT has never been required for lead emissions, IDEM has performed an air quality analysis to measure the impacts of lead emissions from this source. The air quality analysis performed demonstrates that the levels of lead emissions allowed by this permit would have no significant impact on the environment with regards to the NAAQS. The air quality analysis also demonstrates that levels of lead are well below the Permissible Exposure Level (PEL).

Comment #3

Nov 20, 2000 comment:

What role does IDEM have in supervising the data quality of the Toxic Release Inventory? Is IDEM aware that the U.S. EPA airborne emission record for Nucor is zero lead and lead compounds in 1996, and six (6) pounds (not tons) fugitive and three (3) pounds stack lead and lead compound emissions in 1997? When may the public reasonably expect to know the truth on that matter? What is the entirety of the lead and lead compound emission report data that IDEM has received from Nucor from 1996 to the present?

Response #3

IDEM does not have compliance enforcement authority over the Toxic Release Inventory (TRI) program. All of IDEM's efforts towards assuring quality data are submitted for TRI are voluntary compliance assistance. IDEM checks the TRI reports for each source by comparing them to the reports submitted the previous year. IDEM looks for chemical specific increases in reported release values greater than 200 percent and chemical specific decreases in reported release values greater than 75 percent. Additionally, IDEM does a similar comparison with production ratios. IDEM looks at the source's production relative to the use of the specific chemical to see if the ratio dropped 30% or increased by a factor of three from the previous year. All facilities meeting the criteria above receive a letter from IDEM asking them to explain the increase or decrease in question. IDEM typically receives approximately 100 revisions per year as a result of such letters.

TRI reporting guidance allows a lot of flexibility in determining a source's reported values. Basically, all values reported are based on the professional judgement of the person submitting the reports. When EPA audits a source, all supporting documentation used to generate the reported values must be provided to the EPA inspector. The inspector determines if the professional judgement used is reasonable. Citizens who have concerns about the accuracy of a source's TRI reports can contact the U.S. EPA Region V coordinator, Thelma Codina at (312) 886-6291.

Nucor is not required to report their lead emissions to OAQ as part of their annual emission reports. Indiana Rule 326 IAC 2-6-1 only requires them to report emissions of PM-10, SO2, VOC, NOx, and CO. Therefore, the extent of IDEM's information on actual lead emissions from Nucor is what is included in their TRI reports, and the results of any stack tests performed for lead emissions. Nucor conducted a stack test for lead emissions on their existing LMS and the results showed nondetectable levels of lead.

IDEM contacted Nucor to inquire about the accuracy of the lead emissions they reported to TRI over the past several years. Nucor states that they reported lead stack and fugitive emissions for 1996 as a range of 1 to 10 pounds. They are unsure why the TRI report states that the emissions are zero. Regardless, Nucor has re-evaluated their information and concluded that some corrections are necessary to some of the TRI reports. The following table shows the actual lead emissions that Nucor reported to TRI over the past few years along with the necessary revisions.

Year	Fugitive lead emissions as reported to TRI (lbs)	Stack lead emissions as reported to TRI (lbs)	Fugitive lead emissions corrected (lbs)	Stack lead emissions corrected (lbs)
1996	0	0	7	47
1997	6	3	4	49
1998	2	49	13	57

Comment #4

Nov 20, 2000 comment:

Pages 4 and 5 of the TSD list a number of other existing permits. What was the criteria for inclusion here? Permit numbers 107-3599 and 107-3702 do not appear. Why were they excluded? Why is the entire collection of permits not included? Please identify the entire collection of air pollution permits issued to Nucor.

Response #4

The permit history documented in the original TSD only included the PSD permits that have been issued to Nucor Steel. The intention was not to provide a complete list of all permits issued to Nucor; but only to briefly explain some of the history pertaining to the expansion of the source. The following is a complete list of all air pollution permits issued to Nucor Steel's Crawfordsville Plant.

PC (54) 1742, issued on April 28, 1989;
CP 107-2764, issued on November 30, 1993;
Registration CP 107-3794, issued on July 28, 1994;
CP 107-3599, issued on September 22, 1994;
Exemption CP 107-4100, issued on October 27, 1994;
Exemption CP 107-4263, issued on January 5, 1995;
CP 107-3702, issued on March 28, 1995;
Administrative Amendment 107-4631, issued on September 28, 1995;
Administrative Amendment 107-4840, issued on January 17, 1996;
CP 107-5235, issued on June 20, 1996;
CP 107-7298, issued on January 13, 1997;
Administrative Amendment 107-8255, issued on June 23, 1997;
Administrative Amendment 107-8254, issued on July 1, 1997;
Administrative Amendment 107-8731, issued on July 31, 1997;
Administrative Amendment 107-9857, issued on September 17, 1998;
Registration CP 107-9924, issued on February 12, 1999;
Administrative Amendment 107-9751, issued on July 16, 1999;
Administrative Amendment 107-10915, issued on July 16, 1999;
Administrative Amendment 107-11154, issued on August 11, 1999; and
Administrative Amendment 107-11364, issued on November 3, 1999.

Comment #5

Nov 20, 2000 comment:

Regarding the BACT determination for the reciprocating internal combustion diesel engine air compressors, IDEM's determination that add-on controls is impractical is an abuse of discretion. IDEM has a responsibility to give equal consideration to all pollutant producing operations at a facility and to attempt to have the pollutants controlled where the cost is in-line with BACT. Hundreds of millions of mobile sources are controlled by catalyst. Stationary sources are ripe for control as, unlike mobile sources, weight and size of control equipment are not significant factors. IDEM seems to have granted a de facto permit condition allowing 5,000 ppm sulfur ("S") by mass fuel. 50 ppm S fuel is readily available. IDEM is reasonably obligated to consider that as a BACT SO2 control option and economic data supporting a decision is required. Multiple options giving various costs per ton of SO2 for various fuels is needed. Its absence indicates IDEM's failure to perform the specific case by case economic elements of BACT analysis set out in 42 USC 7479(3) law, the same set out in 40 CFR 52.21(b)(12) regulation and the same detailed in the U.S. EPA guidance; the 1990 New Source Review Workshop Manual.

The limits for NOx in Condition D.5.2(a)(2) are listed as 6.70 grams per horsepower-hour. Condition D.5.10 requires the Permittee to submit vendor guarantees for the diesel engine air compressors to demonstrate compliance with this limit. Vendor guarantees do not demonstrate federally enforceable continuous compliance as set out in the NSR manual and are not federally enforceable. We have all seen railroad locomotives in various states of use and various states of maintenance. Some emissions appear relatively clean, some egregiously opaque. There is an obligation to assure continuous compliance with the BACT limit at all times. The permit is an abuse of discretion by de facto waiver. Additionally, this "limit" hinges on horsepower, the quantity of which for the 7 engines seems absent from the document. Thus the people do not know if they are 200 hp, 400 hp, or something else. What is the rate hp?

Assuming 137,000 HHV Btu/gallon, an arbitrary 890 hours/year, an arbitrary 300 hp, IDEM's 124,600 gallons/year, and IDEM's 6.70 grams NOx / hp-hr; a different, more regulatory industry standard emission factor is created:

6.7 / 454 * 300 * 7 * 890 / 124,600 / 137,000 * 1E6.

An abominable 1.6 pounds of NOx per million HHV Btu. This at a time when the IDEM is moving, under U.S. EPA threat, to get other stationary sources to comply with 0.15 lb/MMBtu. NOx is reasonably controlled with catalysts and reagents. IDEM's statement "lack of exhaust gas capture systems" is specious. These are obviously multi-cylinder engines that have manifolds and stacks; i.e. exhaust gas ductwork–ductwork suited to connect to pollution control equipment. As an alternative, requiring electric motors, driven by lossy grid electrical energy from coal fired power plants emitting NOx at 0.60 lb/MMBtu, is closer to BACT than what IDEM has proposed.

The fact is Nucor reasonably requires rotational mechanical energy to operate air compressors. Nucor has no requirement for the proposed diesel engines. If the required mechanical energy source produces on-site NOx, then IDEM has an obligation to do a cost per ton control technology analysis at several levels of control. Its absence indicates IDEM's failure to do the required BACT economic case by case analysis.

A similar comment is in order for the diesel CO emissions. Catalysts are used for mobile sources, they are assuredly applicable for stationary sources. IDEM has an obligation to do a cost per ton control technology analysis at several levels of control. Its absence indicates IDEM's failure to do the required BACT economic case by case analysis.

Dec 29, 2000 comment:

It is my understanding that the seven diesel engines may be labeled "temporary" and therefore, not be considered subject to BACT requirements. There is a difference between avoidance of BACT and evasion of BACT. If these engines are promptly repermitted as temporary, and the IDEM fails to demonstrate that Nucor clearly raised the matter that they wanted a temporary non-BACT permit for them prior to receipt of My November 18, 2000 comments, then I would hope that a suitable judicial venue would find the IDEM has

aided Nucor in evading BACT. I did observe the adjective "prototype" prefixing CBBU in several parts of the draft permit. That is not reasonably synonymous with temporary.

Response #5

Nucor has decided not to install the internal combustion diesel engine air compressors. These units have been removed from the permit. The discussion of BACT for these units has been removed from the BACT analysis contained in Appendix B.

Comment #6

Nov 20, 2000 comment:

Regarding the PM/PM10 BACT for the LMS, IDEM has simply chosen a baghouse and a limit of 0.0018 gr/dscf as BACT without including any economic text whatsoever. Frankly I must wonder if IDEM has any respect for 40 CFR 52.21(b)(12) which states: "The term BACT means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant." IDEM is directly contumacious to the congressional law. This is total abuse of authority. There is no indication of how IDEM arrived at its arbitrary and capricious 0.0018 gr/dscf limit for the LMS. It is as if IDEM feels providing a list of data, absent economic data, and simply internally "thinks 0.0018 is good enough" is good enough to qualify for a BACT economic analysis.

The selection of a baghouse is rather digital. The selection of the degree of control is rather analog. If a given baghouse were to be followed by a second baghouse, the cascaded pair would obviously remove more PM than the single. The cost of pollution control would roughly double with obviously less than twice the PM captured. If the single baghouse design were to be changed, for example, by having 33% more bags and having the velocity of the stack gas impinging on the bags 75% of the original design, two things are certain: the cost of the control would increase and the effectiveness of the control would increase.

IDEM has an obligation to do a cost per ton control technology analysis at several levels of control, i.e. 0.0018, 0.0015, and 0.0012, etc. Its absence indicates IDEM's failure to do the required BACT analysis. In lawyer speak, IDEM should have known than the BACT analysis was a sham prior to issuing the draft permit.

Each of my comments regarding BACT are statements that IDEM has failed to follow the U.S. EPA guidance as set out in the 1990 New Source Review Workshop Manual and the BACT regulation and law. The omissions are reasonably not errors, they are reasonably direct abuse of discretionary authority. To the extent that the economic case by case data is missing, there is direct contumacy by IDEM of the congressional law which grants no discretion allowing the absence of said data.

Response #6

IDEM has completed a BACT analysis based on the top-down BACT guidance provided by the U.S. EPA in the New Source Review Workshop Manual. According to this guidance, the first step in completing a BACT review is to identify all potentially applicable control options (see page B.11). Part of the criteria for determining what is potentially applicable is to identify which control options have been demonstrated to be feasible for a similar facility. IDEM is not aware of any similar facility that has demonstrated that any controls are feasible other than the ones discussed in IDEM's BACT analysis. Specifically, IDEM is not aware of any facility operating two baghouses in series to control emissions from a LMS, CC, or any other similar facility.

Based on the IDEM's review of the RACT/BACT/LAER Clearinghouse (RBLC), the best control option demonstrated to be technically feasible is the use of a single baghouse. The lowest emission limit for similar facilities has been 0.0018 gr/dscf. Therefore, this permit requires the most stringent level of control demonstrated to be achievable by this type of facility. Since the most stringent level of control has been required, IDEM is not required to provide a cost analysis. A cost analysis would only be needed if the best control option was not chosen based on a determination that it would be cost prohibitive. Additionally, IDEM is not required to provide cost analyses for control options and emission limits that have not been demonstrated to be achievable.

Regardless, IDEM did contact a baghouse supplier to inquire about the possibility of obtaining better control efficiency through the use of multiple baghouses in series. The supplier informed IDEM that he believed the use of multiple baghouses in series would not provide any better control efficiency than a single baghouse. He believed that the first baghouse, if designed properly, would filter out all of the larger particles which are necessary in order to provide "caking" on the bags which is necessary for the baghouse to achieve good control efficiency. Without these larger particles, the second baghouse would only collects the fines, which would then blind the baghouse. This would result in the second baghouse being ineffective in controlling emissions. Therefore, the proposed control method of using two (2) baghouses in series is not considered to be technically feasible.

Comment #7

Nov 20, 2000 comment:

A key element in controlling the PM, PM10, and lead emissions is controlling fugitives from specific processes. The permit requires a 99% capture efficiency. Nowhere in the permit document is there any testing or certification whatsoever in support of the mentioned 99% capture efficiency. Thus all of the computations of fugitive emission calculations have no basis, and this permit is not federally enforceable as a practical matter. Absent an independent certification of the mechanical design plans prior to permit issuance, an inspection of the built unit prior to use, and periodic inspection while in use, all by a licensed professional engineer (LPE), there is no reason to believe the fugitive emissions will be limited to any known mathematic ratio to the portion ducted to the baghouse and consequent stack emissions. The omission or waiver of the LPE certifications or any other verifiable method of accountability is an abuse of discretion by IDEM.

Response #7

IDEM points out that fugitive particulate matter emissions from the strip caster are only estimated to be 4.3 tons per year. Regardless, IDEM has reviewed the possibility of requiring total enclosure, instead of allowing Nucor to have a roof monitor above the LMS. Lack of a roof monitor would necessitate a larger baghouse which could handle the additional airflow needed (approximately 950,000 acfm) to exhaust sufficient heat outside the building in order to ensure employee safety. IDEM believes this option is technically feasible; therefore, IDEM required Nucor to submit a cost analysis with regards to the installation of such a baghouse. The annualize cost per ton with regards to PM emissions for the installation of such a baghouse is 8900 dollars per ton of PM removed. This cost is considered to be excessive. The final BACT analysis has been revised to include this additional information and detailed discussion.

Nucor has obtained a letter from their side draft hood supplier stating that a minimum 99% capture efficiency will be achieved with the proposed capture system as long as the baghouse flow rate is maintained at a minimum of 52,000 acfm. The baghouse is designed for 200,000 acfm.

Nucor is required to comply with an opacity limit of 3% from all building openings. They are also required to demonstrate compliance with this requirement by conducting daily Method 9 opacity readings of the

emissions from the roof monitor. This limit is a surrogate tool for demonstrating compliance with the requirement to maintain a minimum 99% capture efficiency.

IDEM does have compliance staff who will periodically inspect the facility while it is in operation. IDEM also has compliance staff who will be present during the required stack test for this facility. These staff are not licensed professional engineers; however, they are experts in their field and in the methods used for stack testing. Such knowledge can only be gained from experience and training specifically on stack testing; which is not usually part of the requirement to become a licensed professional engineer.

Comment #8

Nov 20, 2000 comment:

The Nucor draft permit should be completely redone, and the new draft exposed to a new and complete 30-day comment period with a new public hearing that is at least 20 days into the new comment period. There should also be reasonable consideration given to an extension of the new comment period based on matters presented at the new hearing.

Response #8

The IDEM conducted a public hearing on this PSD modification on November 20, 2000. No specific issues were raised by the public at this hearing or during the informal conversations immediately following the hearing. During the first public comment period, IDEM discovered that CO emissions should also have been analyzed and reviewed under the PSD program. Therefore, the CO emissions were reviewed pursuant to the PSD Program (326 IAC 2-2 and 40 CFR 52.21) and the modified permit was exposed to a second 30-day public comment period. IDEM also held another public hearing on January 4, 2001. At the hearing held on January 4, 2001, no one voiced any objections to IDEM's proposed permit or Nucor's proposed expansion.

IDEM does not believe that it is necessary to completely redraft the permit. IDEM has made some modifications to the permit since the beginning of the second comment period; however none of the modifications are of such magnitude as to require the permit to be exposed to a new 30-day comment period. Additionally, all changes to the permit since the beginning of the second comment period have resulted in making the permit more stringent.

Comment #9

Nov 20, 2000 comment:

Given Nucor's history of construction prior to permit effectivity (as evidenced by the June 23, 1988 notice of violation, EPA-5-88-A-58, issued to Nucor by U.S. EPA), what frequency of inspection does IDEM propose to assure the people that Nucor is not doing their expansion construction prior to the permit being issued? Unlike the 1988 acts, the proposed 2000-2001 expansion can be accomplished rather privately out of public view.

Response #9

IDEM Compliance staff conducted an inspection of the source in December 2000 and did not observe any indication of construction having begun on the proposed expansion project. IDEM staff typically conduct multiple inspections and surveillances each year for all Title V sources, including this one.

Comment #10

Nov 20, 2000 comment:

Comparing the source emissions shown in the proposed TSD for Nucor, a 10-year old steel mill having a 502 ton per hour capacity, to the source emissions listed in the permit for Steel Dynamics (SDI), an un-built steel mill having a 200 tons per hour total capacity, the following is shown:

Pollutant	Nucor Allowable Emissions (tons/year)	SDI Allowable Emissions (tons/year)
PM	178	135
PM10	135	91
SO2	222	222

The serendipity of the identical SO2 numbers from mills having a 5:2 capacity ratio merits a detailed response. The contrast of the total sites' PM also merits a detailed response; for: (135/200) / (178/502) indicates that the "modern" mill would be permitted to be 90% more dirty in regards to PM emissions than the 10-year old mill. This contrast still applies after the proposed Nucor expansion by adding the 47.8 tpy of PM from the proposed expansion: (135/200) / ((178 + 47.8) / 502) indicates that the "modern" mill would still be permitted to be 50% more dirty in regards to PM emissions than the 10-year old mill.

Response #10

As discussed in response to comment #1, IDEM now believes that the existing source allowable emissions prior to this proposed modification as shown on page 6 of the TSD were incorrect. IDEM has reviewed Nucor's prior permits and revised the numbers. The allowable emissions from this modification have also been revised due to other corrections made to the calculations (see pages 20 and 21 for a detailed description of these corrections).

Nucor Allowable Emissions

Pollutant	Existing Source Emissions (tons/year)	Allowable Emissions from this Modification (tons/year)	Total Source Allowable Emissions after this Modification (tons/year)
PM	~~178~~ **259.3**	~~46.3~~ **73.9**	**333.2**
PM-10	~~135~~ **247.6**	~~28.2~~ **61.9**	**309.5**
SO2	~~222~~ **798.6**	~~112~~ **111.0**	**909.6**
VOC	~~261~~ **335.2**	~~12.3~~ **9.7**	**344.9**
CO	~~9755~~ **4647.1**	~~120~~ **113.7**	**4760.8**
NOx	~~14,748~~ **1538.2**	~~124.5~~ **97.7**	**1635.9**
lead	**0.7**	~~0.20~~ **0.014**	**0.714**

With these revisions the allowable emissions for Nucor and SDI are shown in the table below:

Comparison of SDI Allowable Emissions to Nucor Allowable Emissions

Pollutant	Nucor allowable emissions before this modification (tons/year)	Nucor allowable emissions after this modification (tons/year)	SDI allowable emissions (tons/year)
PM	259.3	333.2	135
PM10	247.6	309.5	91
SO2	798.6	909.6	222

As shown in the table above, Nucor's allowable emissions are higher than SDI's allowable emissions both before and after the proposed modification. The ratio of the allowable emissions for the two sources are not exactly equal to the ratio of the capacities of the two sources. There are many reasons for this, some of which are: (1) the two sources are not exactly identical in types and numbers of emission units, (2) due to the BACT analyses having been performed at different times, the control techniques and the emission limits required at the two sources are somewhat different for some of the facilities, (3) there are different methodologies and assumptions which can be used to calculate emissions, and (4) since Nucor has also received several non-PSD permits, not all of Nucor's facilities have been required to comply with BACT. Regardless, with the revised allowables for Nucor, the ratios of allowable emissions for the two sources as compared to the ratios of their capacities, are reasonable.

Comment #11

Dec 27, 2000 comment:

IDEM used HAPs emission factors from AP-42 to estimate hexane and formaldehyde emissions from natural gas combustion units. In IDEM's calculations, the estimated mass of emitted hexane is more than 20 times the mass of formaldehyde. For example, on page 3 hexane 176 / formaldehyde 7.4 = 24.

In simple terms, formaldehyde is half-burned methane, a very much expected product of incomplete combustion. Methane is the principal component of "natural gas." What all the other constituents are of the gas is rather unknown, however, moderate amounts of ethane and ethylene are expected. The alkane hexane and the several other hexane isomers may appear as a tiny part of the gas, but due to their condensing at several pipeline pressures and temperatures and various pipeline liquid removal traps, not much is expected in the gas. None the less, hexanes may be in the gas, and when passed through the burner to be combusted, a tiny fraction of the tiny original may be emitted with no reaction having taken place. It may also be possible for some of the other portions of the gas to be reassembled in to hexanes within the combustion process. And, of course, a molecule of hexane is more than 2.86 times the weight of a molecule of formaldehyde.

The AP-42 factors and IDEM's application of them may be entirely correct. However, all of those possibilities do not rise to the 20:1 ratio favoring hexane. It is reasonably IDEM's duty to inquire into the improbably chemistry, and to offer technical explanation for the apparent inconsistency.

Response #11

IDEM used information provided in Table 1.4-3 of AP-42 to estimate emissions of HAPs from natural gas combustion units. The HAPs emissions from the natural gas-fired combustion units are well below the applicability levels of any rule that would regulate HAPs emissions from such units. The U.S. EPA also considers HAPs emissions from natural gas combustion to be minimal since they have not promulgated any new rules to regulate the HAPs emissions generated solely from natural gas combustion. Since HAPs emissions from these units are well below the applicability levels of any rule that would regulate HAPs

emissions from such units, IDEM does not believe that it is necessary to extensively research the origin of the HAPs emission factors.

Comment #12

Dec 27, 2000 comment:

I believe that IDEM made a typographical error in their calculation of CO emissions from the diesel engines. A maximum capacity of 2.4 is used instead of 2.74, which affects the consequent results.

Response #12

IDEM agrees that there was a typographical error and that the maximum capacity should have been 2.74. However, Nucor has decided not to construct the diesel engines, therefore, this part of the calculations has been deleted and the total emissions revised accordingly.

Comment #13

Dec 27, 2000 comment:

Regarding the December 2000 U.S. v. Nucor agreed order of the South Carolina U.S. District Court involving some $98 million more or less in several states, I understand Indiana was not a party, but that a portion of the money is designated to be spent at the Nucor Crawfordsville Indiana facility. What portion of the $98 million is to be spent at the Crawfordsville facility? Please also explain the nonappearance of any site permit difficulties within the draft permit. Also please detail Nucor's agreements to install NOx pollution control equipment at non-Indiana sites and compare that with what is required at the Crawfordsville Indiana facility.

Response #13

Nucor's responsibilities with regard to the Clean Air portion of the Consent Decree are as follows.

Immediate schedule: No conditions in the Decree mandate any of the pilot studies to be conducted at the Crawfordsville Mill. These pilot studies include the following:

(1) Investigate Pollution Prevention measures for the reduction of NOx emissions from the EAFs;

(2) Test SNCR technology for the control of NOx emissions from the EAFs;

(3) Test lance burner equipment to determine its ability to reduce NOx emissions from the EAFs;

(4) Test reduced NOx burner and exhaust gas recirculation technology for the reduction and control of NOx emissions from a reheat furnace;

(5) Test SCR technology for the control of NOx emissions from a reheat furnace;

(6) Install CEMs at the pilot facilities at the baghouse and reheat furnaces to monitor the trials; and

(7) Apply for appropriate permits, establish new emission limits, modify operating permits and/or Title V permits and demonstrate compliance.

If any of the above trials on the EAFs are successful Nucor shall install and implement the technology at the remaining mini-mills where it is technically and economically feasible. CEMs will also be installed. If the trials for the reheat furnaces are successful, any new reheat furnace Nucor installs will have some form of control for NOx. The next Melt shop that Nucor constructs will incorporate Design for Environment ("DfE") components in its design. If the EAF trials are successful and Crawfordsville is required to install the new equipment then Nucor must apply for the appropriate construction and operating permits. Once operating Nucor must demonstrate compliance with the new limits by the use of CEMs on the EAFs and parametric monitoring for the reheat furnaces.

Crawfordsville will have to re-establish operating baselines as required by NSPS, Subpart AAa, 40 CFR 60.274(a) as applicable for the EAFs according to the schedule in the rule (180 days). Testing at the baghouse at the Crawfordsville plant is estimated to cost $10,000 to $15,000. Nucor Crawfordsville is also required to install a CEM at the baghouse, which is estimated to cost approximately $250,000.

The $98 million is the total maximum cost to Nucor if all of the trials are successful and the control equipment is installed at all the mills, including consultant fees, CEMs, implementation of EMS programs at all mills, any cleanup costs, and the $9 million fine. Assuming trials are successful and controls are installed at the Crawfordsville Plant, the estimated amount to be spent on such controls at the Crawfordsville Plant is approximately $150,000.

A copy of the consent order can be found at htpp://es.epa.gov/oeca/ore/med/nucorconsent.pdf.

IDEM does not typically include in the permit related documents, information regarding noncompliances at plants the source operates outside of Indiana. IDEM has no authority to address these issues.

Comment #14

Dec 27, 2000 comment:

Condition D.6.4(a) requires stack testing for CO and NOx emissions from at least one (1) batch annealing furnace. The permit should require testing on all the furnaces, or a certification by a professional licensed engineer that all were observed operating and professional belief is that one tested is representative of all.

Response #14

Stack testing all eighteen (18) batch annealing furnaces is considered to be cost prohibitive. All eighteen (18) furnaces are of identical design and are subject to the same emission limit; therefore, IDEM has determined that it is not necessary to test all of the units, but rather a representative number of them. IDEM has determined that testing 20% of the units would be sufficient to obtain test results which are representative of the emissions from each of the units. Therefore, the permit condition has been changed requiring that at least four (4) of the units to be tested.

D.6.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform NOx and CO compliance stack tests on at least ~~one (1)~~ **four (4)** batch annealing furnace**s** within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

Comment #15

Dec 27, 2000 comment:

Each of the combustion units listed in the table in Condition D.2.1 should be stack tested. Vendor certification is in no way a surrogate for chemical tests performed on the equipment that is installed and operated at the site. The first paragraph under the title “Compliance Requirements” in the TSD states

"ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis." As written, Conditions D.2.3 and D.6.4, which states no testing is required, makes a legal mockery of that requirement. They are arbitrary, capricious, and an abuse of discretion. They are directly contumacious of 40 CFR 70.6(c), for without testing, there is no evidence whatsoever that there was ever compliance.

Response #15

IDEM does not believe that it is necessary to require testing all of the natural gas-fired combustion units in the permit. The potential to emit of these units is low; therefore IDEM believes that vendor certification is an appropriate demonstration of compliance with the limits.

On December 19, 2000, the U.S. EPA submitted comments on the proposed significant source modification to the Part 70 permit. The summary of the comments is as follows:

Comment #1

Regarding the batch annealing furnaces, we believe the permit does not reflect a proper top-down BACT analysis, according to 40 CFR 52.21. No BACT analysis of low-NOx burners, rated at 0.06 lbs/MMBtu, that are available for sale for steel annealing furnaces, was provided. A March 20, 1998 Letter from Cheryl Newton, of the U.S. EPA to Robert Hodanbosi, of the Ohio EPA, discusses a similar issue related to low-NOx burners at a steel annealing furnace at Pro-Tec facility in Leipsic, Ohio.

Response #1

Further investigation regarding the possibility of lower-emitting NOx burners has been completed. Two vendors were found to offer burners guaranteeing NOx emissions of 0.049 lb/MMBtu for use in these types of annealing furnaces. Only one facility was found which utilizes this type of burners in a batch annealing furnace and that facility was not required to perform any compliance demonstration. As a result, the vendor's claim of achieving these lower NOx emissions with their burners, is unproven. Regardless, a cost analysis was completed to determine the annualized cost of the lower-emitting burners per ton of NOx reduced (as compared to regular burners). The lower of the two costs was $13,600 per ton of NOx reduced. This cost is considered to be excessive. The final BACT analysis has been revised to include this additional information and detailed discussion.

Comment #2

The TSD states that "the debottleneck from the EAF's results in no net emissions increase (past allowable emissions minus future potential emissions)." 40 CFR 52.21 requires that a past actual versus future potential analysis be used to calculate a net emissions increase. We believe that such an analysis is necessary before issuing the permit.

Response #2

The statement in the TSD indicating that the proposed modification is a debottleneck was in error. The existing EAFs each have a maximum capacity of 170.6 tons per hour, for a total capacity of 341.2 tons per hour. Each existing LMS has a maximum capacity of 205.2 tons per hour, for a total capacity of 410.4 tons per hour. Each existing caster (CC) has a maximum capacity of 191.8 tons per hour, for a total capacity of 383.6 tons per hour. Therefore, prior to this modification, the bottleneck in the meltshop was the EAF capacity. The proposed modification does not add any EAF capacity. The proposed modification only increases the LMS and CC capacities. As a result, the proposed modification is not a debottleneck. Therefore, there will be no emission increases from the existing EAFs.

Comment #3

Regarding the BACT for natural gas-fired combustion sources on pages 10 and 11 of Appendix B, it states that the use of "ultra low NOx burners" was "investigated." As discussed in comment #1 above, a proper top-down BACT analysis was not conducted according to 40 CFR 52.21. There was no additional discussion, or cost analysis to remove lower emitting burners out of consideration. BACT was simply set at 0.10 lb/MMBtu or 0.15 lb/MMBtu for each of these units. We believe that the ultra low-NOx burners should be considered in the BACT analysis.

Response #3

The possibility of using ultra low-NOx burners was considered as part of the original BACT analysis. The original BACT as public noticed, supplied the following information regarding the use of ultra low-NOx burners.

> Technically Infeasible Control Options - The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process.

However, IDEM has further investigated the possibility of using ultra low-NOx burners for the ladle and tundish heaters. Bloom Engineering Company, which is a manufacturer of industrial gas and oil burners, has informed Nucor that ultra low-NOx burners would not be suitable for use in such applications. Additionally, IDEM could not find any applications of ultra low-NOx burners in similar facilities. There has been no change to the permit as a result of this comment.

Comment #4

Regarding the BACT for PM/PM10 emissions for the LMS, one percent of the total emissions from the LMS are fugitive, while two percent of the total emissions from the tundish are fugitive. U.S. EPA reviewed an October 1, 1994 memo from John S. Seitz, of the Office of Air Quality Planning and Standards, to the Air Division Directors. This memo refers to the definition of "fugitive emissions" to mean "those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening" (40 CFR 51.165(a)(1)(x)). The memo goes on to state that "the existence of collection technology in use by other sources in the source category creates a presumption that collection is reasonable." Beta Steel (CP127-2326), located in Portage, Indiana, is in the same source category, and demonstrates a 100% capture, or zero percent fugitive emissions, for its steel operations. We believe that a closer look at the control of "fugitive" emissions from the LMS and Tundish are warranted based on the Beta Steel permit.

Response #4

IDEM agrees that other sources have been required to comply with higher capture efficiencies than Nucor is proposing; therefore, IDEM has reviewed the possibility of requiring total enclosure, instead of allowing Nucor to have a roof monitor above the LMS. Lack of a roof monitor would necessitate a larger baghouse which could handle the additional airflow needed (950,000 acfm) to exhaust sufficient heat outside the building in order to ensure employee safety. IDEM believes this option is technically feasible; therefore, IDEM required Nucor to submit a cost analysis with regards to the installation of such a baghouse. The annualized cost per ton with regards to PM emissions for the installation of such a baghouse is $8,900 per ton of PM removed. This cost is considered to be excessive. The final BACT analysis has been revised to include this additional information and detailed discussion.

IDEM believes that the reason such a baghouse is economically feasible at some other facilities, such as Beta Steel, is because most facilities exhaust the electric arc furnace emissions through the same baghouse that controls the LMS and CC. Nucor is proposing a new LMS and CC which will be located in a different building than their existing EAFs; therefore, the baghouse Nucor is proposing will only control emissions from the LMS and CC. Baghouses controlling EAFs are already required to be sized larger to handle additional air flow. Also, a roof canopy is almost always installed above the EAF to capture emissions not directly captured by the fourth hole. EAFs emit much more particulate matter than the LMS and CC; therefore the annualized cost per ton of PM/PM10 controlled for a baghouse controlling an entire meltshop (including an EAF) is much lower than one controlling only a LMS and CC, because there is a much larger amount of emissions when an EAF is involved. EAFs have a greater amount of fugitive emissions because EAF operation includes two phases (charging and tapping) where the lid is open, which reduces the ability of the baghouse to collect emissions. The LMS and CC do not have such phases of operation where the baghouse will not be fully engaged; therefore, fewer fugitive emissions will be generated.

Since there are other sources required to capture 100 percent of the emissions from their meltshop, IDEM agrees that the emissions from Nucor's proposed LMS, Tundish, and strip caster which are not captured by the control device, are not actually "fugitive" emissions according to the October 1, 1994 memo from John S. Seitz, of the Office of Air Quality Planning and Standards, to the Air Division Directors. Therefore, all references to these emissions as "fugitive emissions" have been removed from the permit. The permit and BACT analysis contained in Appendix B now refer to these emissions as the "uncontrolled emissions."

Comment #5

Page 7 of the BACT analysis states that "Nucor Steel calculated the sulfur dioxide (SO2) emissions from the LMS using internal stack test data from its existing LMS." We are concerned that this stack test data may not be U.S. EPA approved, and therefore, may not be sufficiently accurate to use for emission factors, or for future netting calculations. Please provide additional information on the validity of the internal stack test data.

Response #5

There are no emission factors in AP-42 for estimating SO_2 emissions from the LMS and CC; therefore, to estimate emissions from Nucor's proposed LMS and CC, IDEM used the results of stack tests Nucor performed on their existing LMS and CC. The stack tests that Nucor performed on their existing LMS were not approved by the OAQ; which means that Nucor did not submit a protocol to OAQ prior to conducting the stack test and no OAQ representative was present during the test. IDEM does not believe that Nucor has "padded" the results of their tests in order to allow for the possibility of showing a reduction in emissions later in order to gain credits for use in future netting calculations, because the limit proposed is much lower than the limit proposed by any other similar facility. Regardless, IDEM does not allow the use of "unapproved" test results to support credits claimed for a netting analysis. IDEM is requiring OAQ approved stack tests to be conducted for PM/PM10, SO_2, VOC, CO, NOx, and lead, within 180 days after startup. These tests are required to be conducted using U.S. EPA approved test methodologies. If any future netting analysis is conducted, the use of those stack test results would be used in place of the results of the "unapproved" stack testing that Nucor conducted on their existing LMS and CC.

Comment #6

Continuous Emissions Monitors (CEMs) for SO_2, VOC, CO, and NOx are not addressed in this permit. There seems to be no additional assurance to determine compliance for each limit other than an initial, one-time stack test conducted after start-up. We are concerned that there would be no way to continuously assure compliance after this one-time test. We believe that further investigation regarding the technical feasibility of CEMs must be considered for Nucor.

Response #6

In most situations continuous emissions monitoring (CEMs) systems are used to document compliance when a control device is used to reduce emissions. In these instances, there usually is a limited amount of information that could be used to document compliance outside of continuous stack monitoring. In almost all situations where CEMs are used, there is also a large quantity of emissions which could adversely impact air quality if not accurately monitored.

Outside of the Part 70 permitting program and 40 CFR 75 (Compliance Assurance Monitoring), there are a limited amount of State and Federal rules which require a continuous monitoring system. At this time, Nucor is not subject to any State or Federal rule which requires them to install and operate a CEM for NOx, CO, SO_2, or VOC on any of the proposed emission units.

VOC emissions are less than the PSD applicability threshold; therefore IDEM does not believe it is appropriate to require the level of VOC emissions monitoring suggested by the EPA. Additionally, there are no add-on controls proposed for emissions of SO_2, VOC, CO, or NOx from any facility. The natural gas-fired annealing furnaces are required to utilize low-NOx burners and natural gas or propane fuel to demonstrate compliance with their NOx, CO, and SO_2 limits. The LMS is required to demonstrate compliance with its NOx, CO, and SO_2 limits through the use of proper operation. IDEM believes that more frequent stack testing will provide enough information to assess compliance with SO_2, CO, and NOx limits for these facilities. The stack testing conditions have been changed to require that stack testing be repeated annually until such time that the Title V permit for this source is in effect. The changes to the conditions are shown below.

D.1.8 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform filterable and condensible PM/PM_{10} , NOx, CO, SO2, and Pb compliance stack tests for the LMS baghouse stack (S-20) within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity compliance stack tests for the LMS baghouse stack (S-20) and the LMS roof monitor (S-21) within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the LMS baghouse stack, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) **All compliance stack tests shall be repeated annually until such time that the Part 70 permit for this source is in effect.**

(e) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.6.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform NOx and CO compliance stack tests on at least ~~one (1)~~ **four (4)** batch annealing furnace**s** within 60 days after achieving maximum capacity, but no later than 180 days after initial start-up.

(b) **All compliance stack tests shall be repeated annually until such time that the Part 70 permit for this source is in effect.**

(c) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

On November 20, 2000, Dave Sulc, Nucor Steel submitted comments on the proposed significant source modification to the Part 70 permit. The summary of the comments is as follows:

Comment #1

Regarding the BACT for the LMS, Nucor has proposed the use of a negative pressure baghouse with a stack, not a positive pressure baghouse. Nucor disagrees with IDEM's assumption that a negative pressure baghouse and a positive pressure baghouse can achieve the same removal efficiency. The stated basis for this assumption is "baghouse and bag manufacturer's claim" that there is no difference in filtering capacity. However, no documentation is presented concerning which bag and baghouse manufacturers were contacted, what operating assumptions were discussed, and whether the manufacturers were willing to guarantee 8760 hours per year for multiple year operation in compliance with IDEM's proposed 0.0018 gr/dscf limit. While some stack test data is provided, it appears to be based solely on initial compliance testing after startup and not upon continued operation for multiple years. The stack test data are thus not representative of baghouse performance over the life of the facility and there is no assurance that these levels are consistently achievable. As IDEM noted, the RBLC clearly distinguishes between negative pressure and positive pressure baghouses and their long-term efficiencies and Nucor is surprised that IDEM has chosen to ignore the accumulated experience of state air pollution control authorities in the operation of these devices in favor of manufacturers' claims, particularly given manufacturers' incentives to exaggerate control efficiencies to sell their products.

The most stringent demonstrated control efficiency for a negative pressure baghouse is 0.0032 gr/dscf, achieved at Trico Steel, Steel Dynamics, and Qualitech. A more stringent emission rate was proposed, but never achieved, for IPSCO Steel. IPSCO's failure to achieve its permitted limits for its negative pressure baghouse is strongly suggestive that the lower levels proposed by IDEM are not attainable. Furthermore, as almost all of these sources are relatively new, considerable uncertainty exists as to long-term performance. These factors both suggest retaining a less stringent limit consistent with existing BACT at 0.0026 gr/dscf, as proposed by Nucor.

Nucor also objects to assigning limits for both filterable and condensible compounds. There is little data available on the capture and control of the condensible fraction. In the absence of meaningful data, limits for the condensible (and/or total filterable/condensible) fraction should be either eliminated or considered "innovative" pending demonstration that these limits are (1) affected by the capture and control system in place and (2) demonstrated as consistently achievable 8760 hours/year over the life of the facility (with routine maintenance). Nucor cannot agree to a condition, nor may IDEM impose a condition, that is not consistently achievable because such a limit is not "feasible" and hence does not meet the 326 IAC 2-2 requirements for implementation as BACT.

Additionally, Nucor objects to the proposed 0.0018 gr/dscf and 0.0032 gr/dscf limits for the continuous caster, because they are also undemonstrated and inappropriate. See discussion above.

Response #1

In the original BACT analysis IDEM supplied a table showing the results of particulate matter stack tests performed on similar units with negative pressure baghouses. For reference, that table is shown below.

Facility	PM/PM10 Limit	Compliance Information
IPSCO Steel, IA Issued on 8/14/96	0.0025 gr/dscf @ 164 tph steel; 0.0033 gr/dscf @ 200 tph steel; 0.0033 gr/dscf @ 230 tph steel (limits represent filt+condens PM/PM10 and are for meltshop operations) (Permit requires test by Method 5 and 201A with 202)	11/17-19/98 Test: PM (filt): 0.0008 gr/dscf PM10 (condens): 0.0037 gr/dscf @ 120 tph steel. State plans to adjust total (filt+condens) PM/PM10 limit up to 0.0045 gr/dscf.
Nucor Steel-Huger, SC Issued on 8/16/95	0.0035 gr/dscf - (filterable PM/PM10) from meltshop operations) (Permit requires testing by Method 5)	8/5-7/97 Test: PM (filt): 0.00107 gr/dscf @ 202 tph steel rate
Trico Steel, AL	0.0032 gr/dscf (filterable PM/PM10)	9/21/98 Test: PM (filt): 0.0015 gr/dscf, 16 lb/hr (Method 5)
Tuscaloosa Steel, AL 12/15/94	0.0035 gr/dscf, 32.5 lb/hr - Use Method 5 Test (filterable PM/PM10) from meltshop operations (Permit requires Method 5)	No Test Data Available for PM
Roanoke Electric Steel, VA 11/6/98	0.0034 gr/dscf TSP (filterable), 9.8 lb/hr PM, 43.1 tpy PM, 7.5 lb/hr PM10, 32.8 tpy PM10 for EAF Only 0.0052 gr/dscf TSP (filterable), 2.8 lb/hr PM, 12.2 tpy PM, 2,8 lb/hr PM10, 12.2 tpy PM10 for LMS Only (Permit requires test, but no method given)	4/30-5/2/97 Test: PM (filt) from EAF: 0.001 gr/dscf PM (filt) from LMS: 0.0007 gr/dscf
Steel Dynamics-Butler, IN Issued on 6/25/97 (Mod for 2nd EAF)	0.0032 gr/dscf, 35.7 lb/hr (filterable PM/PM10) from meltshop operations	11/17-20/98 Test: PM (filt): 0.00106 gr/dscf PM10 (filt+condens): 0.00299 gr/dscf @ 319 tph steel production 2/2/99 Test: PM (filt): 0.00034 gr/dscf PM10 (filt+condens): 0.00186 gr/dscf @ 329 tph steel production
Qualitech Steel, IN Issued on 10/31/96	0.0032 gr/dscf, 17.36 lb/hr (filterable PM/PM10) for meltshop operations	9/8/99 Test: 1/15/99 Test: PM (filt): 1.52 lb/hr, 0.0004 gr/dscf @ 97 tph steel rate (Method 5 Used)
Beta Steel, IN Issued on 2/24/92	0.0052 gr/dscf, 58.8 lb/hr, 257 tpy (filterable PM/PM10) for meltshop operations	1/19-27/98 Test: PM (filt): 0.000187 gr/dscf PM10 (condens): 0.00032 gr/dscf @ 151 tpy steel production rate 1/31-2/2/99 Test: PM (filt): 0.0003 gr/dscf PM10 (condens): 0.0045 gr/dscf

@ 92 tph steel production rate

Although none of the facilities listed in the table above were limited to 0.0018 gr/dscf for filterable PM/PM10, all of the available stack test data demonstrates compliance with this limitation for filterable PM/PM10. The stack test data also demonstrates compliance with Nucor's total PM/PM10 limit of 0.0052 gr/dscf, including both the filterable and condensible fractions.

With respect to IPSCO Steel in Iowa, the limitation established for the meltshop facility was 0.0025 gr/dscf for total PM/PM10. Total PM/PM10 accounts for both the filterable and condensible fractions. According to the stack test information, once the filterable and condensible fractions are separated, the average filterable PM/PM10 emissions are 0.0008 gr/dscf which is well below Nucor's proposed BACT limitation of 0.0018 gr/dscf.

IDEM also points out that most of the facilities in the table exhaust their electric arc furnace (EAF) emissions through the same baghouse that controls their LMS and CC. Nucor is not proposing to exhaust the EAF emissions through the proposed negative pressure baghouse. AP-42 gives an uncontrolled emission factor of 38 pounds per ton of steel for the melting and refining phases of the EAF operation, which indicates that emissions from the EAF are indeed significant. Therefore, it is reasonable to conclude that since negative pressure baghouses controlling EAFs, LMS, and CC can and do comply with an emission limit of 0.0018 gr/dscf for filterable PM/PM10, then a negative pressure baghouse controlling only the LMS and CC will also be capable of complying with such a limit.

Even though the source believes that the baghouse may not perform as well several years from now as it will soon after startup, there is no reason to believe that will be the case in this situation, or that it is even the case for other sources that have installed negative pressure baghouses. IDEM contacted BHA Group, Inc., a company that provides air pollution control replacement parts and services for baghouses, to obtain information comparing positive pressure baghouses to negative pressure baghouses. BHA Group informed IDEM that both types of baghouses would perform efficiently in an application such as Nucor's proposed strip caster. BHA Group also informed IDEM that the negative and positive pressure baghouses should perform equally well over time, given they are properly designed, operated, and maintained. BHA Group also stated that generally, the fans on positive pressure baghouse systems will experience more wear; therefore, requiring more maintenance than negative pressure baghouses. As a result of this information, IDEM does not believe there is any information to support a conclusion that negative pressure baghouses would perform less effectively over time than a positive pressure baghouse.

Because it is well documented that a negative pressure baghouse can achieve the most stringent BACT limit of 0.0018 gr/dscf for filterable PM/PM10, this limit shall apply to the proposed baghouse for the LMS and CC at Nucor Steel. There has been no change to the permit as a result of this comment.

Comment #2

Regarding the parametric monitoring for the strip caster baghouse, Nucor requests that the "once per shift" frequency be changed to "once per day," given the relatively small size of this unit compared to the main EAF baghouse. While IDEM has suggested that the absolute potential to emit rate of the LMS justifies frequent monitoring, complete failure of the LMS baghouse raising the possibility of PTE rates is almost inconceivable. Actual emissions are much lower and daily monitoring is sufficient to assure the unit operates appropriately. Daily is also consistent with the EPA's CAM rule.

Response #2

Compliance monitoring conditions such as this requirement to keep pressure drop records, are required in order to demonstrate continuous compliance with the permit requirements. Parametric monitoring requirements are used to indicate compliance with 326 IAC 6-3-2 and 326 IAC 2-2 (PSD). Since bag failure can occur suddenly and without warning, possibly causing a violation of 326 IAC 2-2 (PSD) and/or 326 IAC 6-3-2, IDEM does not believe that daily monitoring would be sufficient for the Permittee to demonstrate

continuous compliance. IDEM believes that more frequent monitoring of pressure drop is reasonable and necessary in order to demonstrate continuous compliance. There has been no change to the permit as a result of this comment.

Comment #3

Regarding the LMS baghouse dust silo, Nucor believes that weekly visible emissions notations are excessive because the facility has a maximum emission rate of 0.0086 pound per hour and 0.04 tons per year.

Response #3

The emission rates stated by the applicant are based on controlled emissions when the control device is operating properly. In order to comply with these limits, the control device must operate properly at all times. Since bag failure can occur suddenly and without warning, possibly causing a violation of one or more of the permit limits, IDEM does not believe that less frequent notations would be sufficient for the Permittee to demonstrate continuous compliance. IDEM believes that weekly visible emission notations are reasonable and necessary in order to demonstrate continuous compliance. There has been no change to the permit as a result of this comment.

Comment #4

Nucor requests that any references, conditions, and emissions associated with the seven (7) diesel engine air compressors be removed from the permit. Nucor has decided that the seven diesel engine air compressors are no longer needed, and should be removed from the permit.

Response #4

IDEM has removed the diesel engine air compressors from the permit. The total emission levels have also been modified accordingly.

Comment #5

Why is condensible testing required for the bead blasting system? All of the materials are dry, no elevated temperatures are present, and there is no reason to believe that condensibles would be present beyond intake concentrations.

Response #5

The definition of PM-10 states that PM10 includes both filterable and condensible emissions; therefore, IDEM cannot change the stack test requirement to include only filterable PM10.

Comment #6

Nucor believes that once per shift parametric monitoring for the baghouse controlling the bead blasting unit is excessive. The bead blaster is not a significant source when compared to the EAF baghouse. Nucor requests that the frequency be reduced to once per operating day. Total failure of this unit is unlikely, so its PTE emission rates are irrelevant for determining an appropriate monitoring rate. EPA's CAM rule would specify once per day, which is sufficient to assure compliance.

Response #6

Compliance monitoring conditions such as this requirement to perform visible emission notations, are required in order to demonstrate continuous compliance with the permit requirements. Visible emission notations are used to indicate compliance with 326 IAC 5-1, 326 IAC 6-3-2 and the PM/PM10 limitations

pursuant to 326 IAC 2-2 (PSD) (BACT). Since bag failure can occur suddenly and without warning, possibly causing a violation of one or more of the permit limits, IDEM does not believe that daily notations would be sufficient for the Permittee to demonstrate continuous compliance. IDEM believes that once per shift visible emission notations are reasonable and necessary in order to demonstrate continuous compliance. There has been no change to the permit as a result of this comment.

Comment #7

The permit number varies between the TSD and BACT documents.

Response #7

The source modification number on the BACT document was incorrect. The correct source modification number is 107-12143-00038. This correction has been made to the final BACT document.

Comments Regarding the Calculations (Appendix A)

Comment #1

Fugitive emissions have not been calculated for the LMS and caster. Additionally, there are no natural gas combustion emission sources in the LMS; therefore delete the HAPs emission calculations for natural gas combustion from the LMS.

Response #1

IDEM agrees. Uncontrolled emissions have been calculated for the LMS and caster. The HAPs emission calculations from natural gas combustion from the LMS have been deleted.

Comment #2

Regarding item 1 on page 3 of the calculations, the correct throughput is 135 tons per hour. PM10 and TSP were incorrectly calculated. The emission factors in grains/dscf need to be multiplied by the flow rate in dscfm.

Response #2

IDEM agrees and has made the appropriate changes.

Comment #3

Regarding item 4 on page 4 of the calculations, PM emissions are incorrectly calculated. The result should be 0.04 tons per year.

Response #3

IDEM agrees and has made the appropriate changes.

Comment #4

Regarding item 2 on page 6 of the calculations, PM and TSP emissions are incorrectly calculated. The results should be 0.93 pounds per hour and 4.05 tons per year.

Response #4

IDEM agrees and has made the appropriate changes.

Comment #5

Regarding item 3 on page 6 of the calculations, PM and TSP emissions are incorrectly calculated. The results should be 0.086 pounds per hour and 0.38 tons per year.

Response #5

IDEM agrees and has made the appropriate changes.

Comment #6

Regarding item C.2 on page 7, PM and TSP emissions are incorrectly calculated. The TSP results should be 0.04 tons per year and 0.72 tons per year (all eighteen units). The PM-10 results should be 0.12 tons per year and 2.12 tons per year (all eighteen units).

Response #6

IDEM agrees and has made the appropriate changes.

Comment #7

Conditions in Section D refer to a Condition titled "Emergency Provisions," but there is no such condition in the permit.

Response #7

IDEM has added the Emergency Provisions condition to the permit. The condition is shown below.

B.6 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation, except as provided in 326 IAC 2-7-16.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a health-based or technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or
Telephone Number: 317-233-5674 (ask for Compliance Section)
Facsimile Number: 317-233-5967

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) IDEM, OAQ, may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(10) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ, by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) Operations may continue during an emergency only if the following conditions are met:

(1) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

(2) If an emergency situation causes a deviation from a health-based limit, the Permittee may not continue to operate the affected emissions facilities unless:

(A) The Permittee immediately takes all reasonable steps to correct the emergency situation and to minimize emissions; and

(B) Continued operation of the facilities is necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value.

Any operation shall continue no longer than the minimum time required to prevent the situations identified in (g)(2)(B) of this condition.

Comments Regarding the Air Quality Analysis

Comment #1

Page 1 - Introduction -- add lead and ozone as criteria pollutants.

Response #1

IDEM agrees and has made the appropriate change.

Comment #2

Page 1 - Summary -- 12th line change “below” to “above”.

Response #2

IDEM agrees and has made the appropriate change.

Comment #3

Page 2 - Table 1 -- delete “(ozone)” after VOC.

Response #3

IDEM agrees and has made the appropriate change.

Comment #4

Page 3 - Table 2 -- the significant impact increments and significant monitoring levels are integers and should not be reported with a decimal point.

Response #4

IDEM agrees and has made the appropriate change.

Comment #5

Page 4 - Background Concentrations -- in the 1st line delete NO_2. Also, in the third line delete "for PM_{10} and SO_2."

Response #5

IDEM does not believe it is necessary to re-word the discussion on background concentrations, as suggested.

Comment #6

Page 5 - Table 4: Add Pb concentrations and compare to NAAQS. The maximum annual NO_2 is 14.9 ug/m^3 when accounting for 0.75 factor. The highest second highest 24-hour average PM_{10} concentration is 28.2 ug/m^3.

Response #6

IDEM agrees and has made the appropriate changes.

Comment #7

Page 6 - Table 5 -- URS modeling had 14.2 ug/m^3 for NO_2; IDEM reports 16.0 ug/m^3.

Response #7

IDEM agrees and has made the appropriate change.

Comment #8

Page 6 - Table 6 -- URS modeled 28.2 ug/m^3 as maximum 24-hour average PM_{10} concentration.

Response #8

The 28.2 ug/m^3 that Nucor is referring to is the entire increment consumption from all sources. IDEM didn't show this in the air quality analysis report in Appendix C. The main concern was to show that the Nucor modification did not violate the 80 percent of the available increment.

Comment #9

Page 7 - Table 7 -- Pb should be reported as a criteria pollutant, delete from this table.

Response #9

Lead is calculated as both a criteria pollutant and a HAP; therefore no change has been made to this table.

Comment #10

Page 7 - Part F -- In the 3rd line change "Consultants" to "Corporation".

Response #10

IDEM agrees and has made the appropriate change.

Comment #11

On page 8 under Economic Growth and Impact of Construction Analysis, 20 people employed should be changed to 100 people employed.

Response #11

IDEM agrees and has made the appropriate change.

On December 22, 2000, Dave Sulc, Nucor Steel submitted additional comments on the proposed significant source modification to the Part 70 permit. The summary of the comments is as follows:

Comment #1

On page 3 of the permit, the correct zip code is 47933

Response #1

The change has been made.

Comment #2

On page 5, item (c)(4), the noncontact cooling tower is rated at 12,000 gallons per minute. This change needs to be made throughout the permit and relating documents.

Response #2

The requested change has been made throughout the permit. The calculations have also been revised accordingly. See Appendix A for detailed calculations.

Comment #3

On page 5, item (e)(1), the word “bead” should be removed from the description of the continuous bead blasting system and bead storage silo. This change should be made throughout the permit.

Response #3

The change has been made throughout the permit.

Comment #4

On page 11 of 34, remove the word “commercial” from Condition C.11(a)(5).

Response #4

The change has been made, as shown below. The condition has been re-numbered as C.12

C.12 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 2-7-5][326 IAC 2-7-6] [326 IAC 1-6]

(a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. The compliance monitoring plan can be either an entirely new document, consist in whole information contained in other documents, or consist of a combination of new information and information contained in other documents. If the compliance monitoring plan incorporates by reference information contained in other documents, the Permittee shall identify as part of the compliance monitoring plan the documents in which the information is found. The elements of the compliance monitoring plan are:

(1) This condition;

(2) The Compliance Determination Requirements in Section D of this approval;

(3) The Compliance Monitoring Requirements in Section D of this approval;

(4) The Record Keeping and Reporting Requirements in Section C (Monitoring Data Availability, General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this approval; and

(5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this approval. CRPs shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The Permittee shall prepare and implement the CRPs upon ~~commercial~~ operation, as defined in Condition C.5. The CRPs are comprised of:

Comment #5

In Condition D.1.1(a)(1) replace “LMS” with “strip caster.”

Response #5

The change has been made, as shown below. Condition D.1.1 has also been changed to clarify that the lids on the ladles must be closed at all times when transporting molten metal in the ladles. The revised condition is shown below.

D.1.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall comply with the following requirements:

(1) The ladles associated with the ~~LMS~~ **strip caster** shall be ~~equipped~~ **covered** with lids **which shall be closed at all times when transporting molten metal in the ladles, in order** to minimize fugitive emissions**.** ~~during the transportation of the ladles;~~

Comment #6

In Condition D.1.1(a)(4) and (5), the air flow should be 200,000 dscfm.

Response #6

The requested change has been made, as shown below. This change has also been made in the BACT analysis (Appendix B).The correct air flow was used in the calculations; therefore, no change is necessary to the calculations.

D.1.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall comply with the following requirements:

(4) The filterable PM**/**PM_{10} emissions from the LMS baghouse shall not exceed 0.0018 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of ~~266,100~~ **200,000** dry standard cubic feet per minute;

(5) The filterable and condensible PM/PM_{10} emissions from the LMS baghouse shall not exceed 0.0052 gr/dscf at a maximum volumetric air flow rate of ~~266,100~~ **200,000** dry standard cubic feet per minute; and

Comment #7

Regarding Condition D.1.7, 326 IAC 8-1-6 (BACT) should not apply because VOC emissions are less than 25 tons per year.

Response #7

IDEM agrees. This condition has been removed from the permit. All subsequent conditions in Section D.1 have been renumbered appropriately.

~~D.1.7 Volatile Organic Compound (VOC) Limitation~~

~~Pursuant to the requirements of 326 IAC 8-1-6 (New Facilities; General VOC Reduction Requirement) VOC emissions from the LMS will be controlled by good combustion practices.~~

Comment #8

Condition D.1.14(a) should reference D.1.9 instead of D.1.8.

Response #8

IDEM agrees that Condition D.1.14(a) (now re-numbered as D.1.13) of the draft permit did reference the wrong condition. Now that Condition D.1.7 has been deleted and all subsequent conditions renumbered appropriately, the correct reference is now Condition D.1.8. Therefore, there has been no change to this condition.

Comment #9

Nucor Steel appreciates IDEM's revisions to incorporate measuring fan amperes as a surrogate for fan speed measurement as is done under the NSPS Subpart AAa Standards, which address EAF baghouses. However, to avoid unnecessary confusion, Nucor requests that the language follow the well understood Subpart AAa compliance methodology. For example, a "minimum rate" of fan amperes is not established during compliance testing, but rather an average that indicates operating conditions during compliance. Troubleshooting, contingency and response steps would be necessary only when average fan amperes for the fan system vary within plus or minus 15% of the value established during the compliance testing. Accordingly, Nucor requests that IDEM revise the condition to state that the fan amperes must be maintained within plus or minus 15% of the rate established during testing.

Response #9

IDEM agrees and has made the change, as shown below. IDEM has also included requirements regarding the device used to measure the fan amperes.

D.1.11 Parametric Monitoring for the Baghouse, Side Draft Hood, and Canopy Hood

(a) The Permittee shall record the total static pressure drop across the LMS baghouse, at least once per shift when the associated LMS or continuous strip caster is in operation. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 2.0 and 8.0 inches of water or a range established during the most recent compliant stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the pressure reading is outside of the above-mentioned range for any one reading.

The instrument used for determining the pressure shall comply with ~~Condition C.10~~ **Section C -** ~~(~~Pressure Gauge **and Other Instrument** Specifications~~)~~**,** of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

(b) The Permittee shall record the fan amperes of LMS baghouse fan at least once per shift. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the fan amperes of the capture and control system shall be maintained ~~at a minimum~~ **within plus or minus 15% of the** rate established during the most recent compliant stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the fan amperes ~~is~~ **are more than 15% above or** below the above-mentioned rate for any one reading.

The instrument used for determining the fan amperes shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

Comment #10

Condition D.1.15 references the D.1.9 instead of D.1.8.

Response #10

IDEM agrees that Condition D.1.15 (now renumbered D.1.14) of the draft permit did reference the wrong condition. Now that Condition D.1.7 has been deleted and all subsequent conditions renumbered appropriately, the correct reference is now Condition D.1.8. Therefore, there has been no change to this condition.

Comment #11

Condition D.2.4 should reference Condition D.2.1(1) and (2).

Response #11

IDEM agrees and has made the appropriate change.

D.2.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) all vendor guarantees of the above-mentioned combustion units to demonstrate compliance with Operation Conditions D.2.1(a)(1) and (~~3~~**2**).

Comment #12

Regarding the reference to Condition D.4.1(a)(1) and (3) in Condition D.4.4, delete the (1) and (3).

Response #12

The change has been made. The condition now also references D.4.1(c).

D.4.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantee for the above-mentioned ladle preheater to demonstrate compliance with Operation Conditions D.4.1(a)~~(1) and (3)~~ **and (c)**.

Comment #13

Regarding the reference to Condition D.6.1(a) and (b) in Condition D.6.5, change the (b) to (c).

Response #13

The change has been made, as shown below. The condition now also references D.6.1(d).

D.6.5 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantees for the above-mentioned batch annealing furnaces to demonstrate compliance with Operation Conditions D.6.1(a)**, (c)** and ~~(b)~~**(d)**.

Comment #14

Nucor does not believe the table on page 6 of the TSD accurately represents the allowable emissions for Nucor Steel prior to this proposed modification. Additionally, Nucor does not believe that the totals for this modification are correct. The HAPs are also listed incorrectly.

Response #14

IDEM agrees. The revised numbers are shown in the table below. The table below also shows the revised allowable emissions for this modification as well as the total allowable emissions after this proposed modification.

Pollutant	Existing Source Emissions (tons/year)	Allowable Emissions from this Modification (tons/year)	**Total Source Allowable Emissions after this Modification (tons/year)**
PM	~~178~~ **259.3**	~~46.3~~ **73.9**	**333.2**
PM-10	~~135~~ **247.6**	~~28.2~~ **61.9**	**309.5**
SO2	~~222~~ **798.6**	~~112~~ **111.0**	**909.6**
VOC	~~261~~ **335.2**	~~12.3~~ **9.7**	**344.9**
CO	~~9755~~ **4647.1**	~~120~~ **113.7**	**4760.8**
NOx	~~14,748~~ **1538.2**	~~124.5~~ **97.7**	**1635.9**
lead	**0.7**	~~0.20~~ **0.014**	**0.714**

The following table shows the revised total allowable HAPs emissions from the proposed modification.

HAP Pollutant	PTE (tons/yr)
Benzene	~~0.01~~ **0.00**
Formaldehyde	~~0.13~~ **0.06**
Naphthalene	~~3.38~~ **0.00**
Toluene	~~0.02~~ **0.00**
Hexane	~~0.01~~ **1.37**
Xylene	~~0.002~~ **0.000**
Propylene	~~0.02~~ **0.00**
1,3 Butadiene	~~0.003~~ **0.0000**
Acetaldehyde	~~0.01~~ **0.00**
Acrolein	~~0.001~~ **0.000**
Lead Compounds	~~0.20~~ **0.014**
Total HAPs	~~3.77~~ **1.44**

Comment #15

On page 6 of the TSD, item (d) should state that the LMS is controlled by a side draft hood and the continuous caster is controlled by a canopy hood.

Response #15

There are no changes to the TSD after public notice; however, the correction is noted here in the addendum and the correct descriptions are included in the final permit.

Comment #16

The limit pursuant to 326 IAC 6-3-2 for the bead blasting system is incorrect on page 9 of the TSD. The correct limit is 48.6 pounds per hour, not 69.0 pounds per hour.

Response #16

IDEM agrees. There are no changes to the TSD after public notice; however, the correction is noted here in the addendum and the correct limit is included in the final permit.

Comment #17

On page 1 of Appendix A, the bead blaster unit and silo should be listed under the heading “Other Modifications” instead of “Existing Meltshop Modification.”

Response #17

The requested change has been made.

Comment #18

On page 6 of the permit, item (b)(5), please remove the words "located on the caster deck." They will remain in the same building but may not be located on the caster deck.

Response #18

The requested change has been made, as shown below.

(5) Natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and not exceed a total heat input capacity of 15 MMBtu per hour. These preheaters shall be used in the tundish operations ~~located on the caster deck~~.

Comment #19

In Condition C.8, replace the word "operation" with the word "startup."

Response #19

The requested change has been made, as shown below.

C.8 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

All monitoring and record keeping requirements shall be implemented upon ~~operation~~ **startup**. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

Upon further review, IDEM has decided to make the following additional changes to the permit:

Section A

(1) A.1 (General Information) the following rule cite has been added, which is the definition of a major source in 326 IAC 2-7.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)] **[326 IAC 2-7-1(22)]**

The Permittee owns and operates a steel mill.

Section C

(1) The record keeping requirements have been added to Condition C.2 (Preventive Maintenance Plan).

C.2 Preventive Maintenance Plan [326 IAC 2-7-5(1),(3) and (13)] [326 IAC 2-7-6(1) and (6)] [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) upon operation. The PMP shall include the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond ~~it's~~ **the Permittee's** control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) The Permittee shall implement the PMPs as necessary to ensure that failure to implement a PMP does not cause or contribute to a violation of any emissions limitation.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ, upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or contributes to any violation. The PMP does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(4) **Records of preventive maintenance shall be retained for a period of at least five (5) years. These records shall be kept at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.**

(2) The following revisions were made to Condition C.5 (Operation of Equipment) to clarify the condition.

C.5 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by **statute, rule, or** in this approval, all air pollution control equipment listed in this approval and used to comply with an applicable requirement shall be operated at all times that the emission unit vented to the control equipment is in operation.

(3) Language has been added to Condition C.6 (Stack Height) clarify which parts of 326 IAC 1-7 are not federally enforceable.

C.6 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted by using good engineering practices (GEP) pursuant to 326 IAC 1-7-3. **The provisions of 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4(d)(3), (e), and (f), and 326 IAC 1-7-5(d) are not federally enforceable.**

(4) For clarification, the following changes have been made to Condition C.7 (Performance Testing).

C.7 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, utilizing any applicable procedures and analysis methods specified in 40

CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

(b) All test reports must be received by IDEM, OAQ ~~within~~ **not later than** forty-five (45) days after the completion of the testing. An extension may be granted by the IDEM, OAQ if the source submits to IDEM, OAQ, a reasonable written explanation ~~within~~ **not later than** five (5) days prior to the end of the initial forty-five (45) day period.

The documentation submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(5) Condition C.9 (Maintenance of Monitoring Equipment) has been replaced with two new conditions. For clarification purposes, there are now two separate conditions; one which applies to COMs only, and another which applies to all other types of emission monitoring equipment. The rest of Section C has been re-numbered to account for the new condition.

~~C.9 Maintenance of Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]~~

~~(a) In the event that a breakdown of the monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.~~

~~(b) In the case of continuous opacity monitoring, whenever the continuous opacity monitor is malfunctioning or will be down for repairs or adjustments for a period of four (4) hours or more, visible emission readings should be performed in accordance with 40 CFR 60, Appendix A, Method 9, beginning four (4) hours after the start of the malfunction or down time for a minimum of one (1) hour.~~

~~(c) If the reading period begins less than one hour before sunset, readings shall be performed until sunset. If the first required reading period would occur between sunset and sunrise, the first reading shall be performed as soon as there is sufficient daylight.~~

~~(d) Method 9 opacity readings shall repeated for a minimum of one (1) hour at least once every four (4) hours during daylight operations, until such time that the continuous opacity monitor is back in operation.~~

~~(e) The opacity readings during this period shall be reported in the quarterly Compliance Monitoring Reports, unless there are ANY observed six minute averaged exceedances, in which case, these shall be reported to the air compliance inspector within four (4) working hours.~~

~~(f) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.~~

C.9 Maintenance of Emission Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the emission monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem. To the extent practicable, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less frequent than required in Section D of this permit until such time as the monitoring equipment is back in operation. In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less often than once an hour until such time as the continuous monitor is back in operation.

(b) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.

C.10 Maintenance of Opacity Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the continuous opacity monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.

(b) In the case of continuous opacity monitoring, whenever the continuous opacity monitor is malfunctioning or will be down for repairs or adjustments for a period of four (4) hours or more, visible emission readings should be performed in accordance with 40 CFR 60, Appendix A, Method 9, beginning four (4) hours after the start of the malfunction or down time for a minimum of one (1) hour.

(c) If the reading period begins less than one hour before sunset, readings shall be performed until sunset. If the first required reading period would occur between sunset and sunrise, the first reading shall be performed as soon as there is sufficient daylight.

(d) Method 9 opacity readings shall repeated for a minimum of one (1) hour at least once every four (4) hours during daylight operations, until such time that the continuous opacity monitor is back in operation.

(e) The opacity readings during this period shall be reported in the quarterly Compliance Monitoring Reports, unless there are ANY observed six minute averaged exceedances, in which case, these shall be reported to the air compliance inspector within four (4) working hours.

(f) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary opacity monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.

(6) Condition C.10, now re-numbered as C.11 (Pressure Gauge Specifications) has been revised to include specifications for measuring the fan amperage.

C.11 Pressure Gauge **and Other Instrument** Specifications **[326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]**

(a) Whenever a condition in this permit requires the measurement of pressure drop across any part of the unit or its control device, the gauge employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

(b) Whenever a condition in this permit requires the measurement of a fan amperage, the instrument employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

(7) The following changes were made to Condition C.11, now re-numbered C.12 (Compliance Monitoring Plan - Failure to Take Response Steps).

C.12 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. The compliance monitoring plan can be either an entirely new document, consist in whole **of** information contained in other documents, or consist of a combination of new information and information contained in other documents. If the compliance monitoring plan incorporates by reference information contained in other documents, the Permittee shall identify as part of the compliance monitoring plan the documents in which the information is found. The elements of the compliance monitoring plan are:

(1) This condition;

(2) The Compliance Determination Requirements in Section D of this permit;

(3) The Compliance Monitoring Requirements in Section D of this permit;

(4) The Record Keeping and Reporting Requirements in Section C (Monitoring Data Availability, General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this permit; and

(5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this permit. CRP's shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The CRP shall be prepared within ninety (90) days after issuance of this permit by the Permittee and maintained on site, and is comprised of:

(A) Reasonable response steps that may be implemented in the event that compliance related information indicates that a response step is needed pursuant to the requirements of Section D of this permit; and

(B) A time schedule for taking reasonable response steps including a schedule for devising additional response steps for situations that may not have been predicted.

(b) For each compliance monitoring condition of this permit, reasonable response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to take reasonable response steps ~~shall~~ **may** constitute a violation of the permit.

(c) Upon investigation of a compliance monitoring excursion, the Permittee is excused from taking further response steps for any of the following reasons:

(1) A false reading occurs due to the malfunction of the monitoring equipment. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.

(2) The Permittee has determined that the compliance monitoring parameters established in the permit conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the permit, and such request has not been denied. ~~; or~~

(3) An automatic measurement was taken when the process was not operating. ~~; or~~

(4) The process has already returned or is returning to operating within "normal" parameters and no response steps are required.

(d) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken. In the event of an emergency, the provisions of 326 IAC 2-7-16 (Emergency Provisions) requiring prompt corrective action to mitigate emissions shall prevail.

(e) All monitoring required in Section D shall be performed at all times the equipment is operating. If monitoring is required by Section D and the equipment is not operating, then the Permittee may record the fact that the equipment is not operating or perform the required monitoring.

(f) At its discretion, IDEM may excuse the Permittee's failure to perform the monitoring and record keeping as required by Section D, if the Permittee provides adequate justification and documents that such failures do not exceed five percent (5%) of the operating time in any quarter. Temporary, unscheduled unavailability of qualified staff shall be considered a valid reason for failure to perform the monitoring or record keeping requirements in Section D.

(8) Condition C.12, now re-numbered C.13 (Actions Related to Noncompliance Demonstrated by a Stack Test) "corrective actions" has been changed to "response actions" to be consistent with the rest of the permit.

C.13 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate ~~corrective~~ **response** actions. The Permittee shall submit a description of these ~~corrective~~ **response** actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the ~~corrective~~ **response** actions are being implemented.

(9) Condition C.13 (Monitoring Data Availability) has been deleted because it was incorporated into C.11 Compliance Monitoring Plan- Failure to Take Response Steps. The rest of Section C has been re-numbered to account for the deletion of C.13.

~~C.13 Monitoring Data Availability [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)]~~

~~(a) With the exception of performance tests conducted in accordance with Section C-Performance Testing, all observations, sampling, maintenance procedures, and record keeping, required as a condition of this approval shall be performed at all times the equipment is operating at normal representative conditions.~~

~~(b) As an alternative to the observations, sampling, maintenance procedures, and record keeping of subsection (a) above, when the equipment listed in Section D of this approval is not operating, the Permittee shall either record the fact that the equipment is shut down or~~

~~perform the observations, sampling, maintenance procedures, and record keeping that would otherwise be required by this approval.~~

~~(c) If the equipment is operating but abnormal conditions prevail, additional observations and sampling should be taken with a record made of the nature of the abnormality.~~

~~(d) If for reasons beyond its control, the operator fails to make required observations, sampling, maintenance procedures, or record keeping, reasons for this must be recorded.~~

~~(e) At its discretion, IDEM, OAQ may excuse such failure providing adequate justification is documented and such failures do not exceed five percent (5%) of the operating time in any quarter.~~

~~(f) Temporary, unscheduled unavailability of staff qualified to perform the required observations, sampling, maintenance procedures, or record keeping shall be considered a valid reason for failure to perform the requirements stated in (a) above.~~

(10) Condition C.14 (General Record Keeping Requirements) the word “monitoring” was removed. The word “reports” was added to clarify that the source must keep copies of those as well. Parts (b) and (c) have been removed because they were unnecessary. Also, all record keeping requirements should begin upon startup.

C.21 General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6]

(a) Records of all required ~~monitoring~~ data, **reports** and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

~~(b) Records of required monitoring information shall include, where applicable:~~

~~(1) The date, place, and time of sampling or measurements;~~

~~(2) The dates analyses were performed;~~

~~(3) The company or entity performing the analyses;~~

~~(4) The analytic techniques or methods used;~~

~~(5) The results of such analyses; and~~

~~(6) The operating conditions existing at the time of sampling or measurement.~~

~~(c) Support information shall include, where applicable:~~

~~(1) Copies of all reports required by this permit;~~

~~(2) All original strip chart recordings for continuous monitoring instrumentation;~~

~~(3) All calibration and maintenance records;~~

~~(4) Records of preventive maintenance shall be sufficient to demonstrate that failure to implement the Preventive Maintenance Plan did not cause or contribute to a violation of any limitation on emissions or potential to emit. To be relied upon subsequent to any such violation, these records may include, but are not limited to: work orders, parts inventories, and operator's standard operating procedures. Records of response steps taken shall indicate whether the response steps were performed in accordance with the Compliance Response Plan required by Section C - Compliance Monitoring Plan - Failure to take Response Steps, of this approval, and whether a deviation from an approval condition was reported. All records shall briefly describe what maintenance and response steps were taken and indicate who performed the tasks.~~

~~(d)~~**(b) Unless otherwise specified in this permit,** all record keeping requirements not already legally required shall be implemented ~~within ninety (90) days of permit issuance~~ **upon startup.**

(11) Condition C.15 (General Reporting Requirements) in (c) IDEM has clarified that the reports do need to be certified by the responsible official. This change is also reflected in all the D sections and the reporting forms. EPA has requested this change.

C.15 General Reporting Requirements [326 IAC 2-7-5(3)(C)]

(a) The reports required by conditions in Section D of this approval shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) Unless otherwise specified in this approval, any notice, report, or other submission required by this approval shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) Unless otherwise specified in this approval, any quarterly report shall be submitted within thirty (30) days of the end of the reporting period. The reports do ~~not~~ require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(d) The first report shall cover the period commencing on the date of issuance of this approval and ending on the last day of the reporting period.

Sections D

(1) The following statement has been added to the end of Conditions D.1.9, D.3.4, and D.5.5 (Visible Emissions Notations), D.1.10 (Parametric Monitoring for the Baghouse, Side Draft Hood, and Canopy Hood), D.1.12 (Broken or Failed Bag Detection), D.3.6 and D.5.8 (Broken or Failed Bin Vent Filter Detection), D.5.6 (Parametric Monitoring):

Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(2) Condition D.1.15 (now renumbered as D.1.14) now includes a requirement to submit a quarterly report to demonstrate compliance with the production limit established in Condition D.1.6.

D.1.14 Reporting Requirements

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.1.8 in accordance with the reporting requirements established in Conditions C.7 and C.15 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) A quarterly summary of the information to document compliance with Condition D.1.6 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported.

(3) For clarification, Condition D.3.1(b) has been changed as follows:

D.3.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the **emissions from** dumping, storage, and transfer operations of raw materials shall not exceed five percent (5%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(4) For clarification, Conditions D.5.10 and D.6.7 have been changed as follows:

D.5.10 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Conditions D.5.4 in accordance with the reporting requirements established in ~~Conditions C.7 and C.15~~ **Section C - Performance Testing and Section C - General Reporting Requirements,** to demonstrate compliance with Operation Conditions D.5.1(a)(2) and (3).

(5) The certification form has been revised to include an option for submission of an affidavit.

General Changes throughout the permit.

(1) The Office of Air Management (OAM) has changed its name to the Office of Air Quality (OAQ). This change has been made throughout the permit.

Indiana Department of Environmental Management
Office of Air Management

Technical Support Document (TSD) for a Part 70 Significant Source Modification requiring PSD Review.

Source Background and Description

Source Name:	Nucor Steel
Source Location:	Route 2, Box 311, Crawfordsville, Indiana 47933
County:	Montgomery
SIC Code:	3312
Operation Permit No.:	107-7172-00038
Operation Permit Issuance Date:	Not Yet Issued
Significant Source Modification No.:	107-12143-00038
Permit Reviewers:	Michele M. Williams, Iryn Calilung, and Nisha Sizemore

The Office of Air Management (OAM) has reviewed a modification application from Nucor Steel relating to the construction of the following emission units and pollution control devices:

(a) A strip caster line rated at a maximum steel production rate of 135 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of 99 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted through the LMS baghouse stack identified as S-20. The remaining fugitive emissions shall be exhausted through the LMS roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of 98 percent. The captured particulate matter in the gas stream shall be controlled by the LMS baghouse and the gas stream shall be exhausted though the LMS baghouse stack identified as S-20. The remaining fugitive emissions shall be exhausted through the LMS roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strips from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strips;

(4) Descaling operations utilizing water to remove scale from the steel strip;

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 135 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths, thicknesses and sizes. The coiled

product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2 and one (1) natural gas-fired ladle dryer identified as LD-1. Each ladle preheater and dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 6 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(3) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1.0 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21;

(4) Two (2) natural gas-fired tundish dryers identified as TD-1 and TD-2. Each tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 9 MMBtu per hour, and has the capability to utilize propane as a backup fuel. Combustion emissions exhaust to either the LMS baghouse stack identified as S-20 or the LMS roof monitor identified as S-21; and

(5) Natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and not exceed a total heat input capacity of 15 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck.

(c) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS baghouse dust loading silo equipped with a bin vent filter, or equivalent, for material recovery and particulate matter control. The emissions from the LMS dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new or existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with a maximum water flow rate of 12,000 gallons per minute and one (1) noncontact cooling tower system with a maximum water flow rate of 9,000 gallons per minute; and

(5) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations.

(d) One (1) additional natural gas-fired ladle preheater to the existing meltshop, identified as LP-4. This preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input capacity of 15 MMBtu per hour, and has the capability to utilize propane as a backup fuel. The existing melt shop building will also be expanded in size, there is no emission increase due to this building expansion.

(e) One (1) continuous bead blasting system:

(1) One (1) prototype continuous bead blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill building and roof monitor, identified as S-28, will also be constructed;

(2) One (1) bead storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Seven (7) reciprocating internal combustion diesel engine air compressors. Each air compressor has a maximum heat input rate of 2.74 MMBtu per hour.

(4) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width. No emission impacts are anticipated because the shear is a “clip” or “knife cut” form rather than a saw or flame cut.

The bead blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(f) The addition of eighteen (18) natural gas-fired batch annealing furnaces, utilizing propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

History

(a) The following review provides a short summary of the permitting history for the existing electric arc furnaces (EAFs) at Nucor Steel:

(1) PC (54) 1742, Issued on April 28, 1989 - This PSD permit was to construct a steel mill designed to process approximately 1,400,000 tons per year of hot and cold rolled steel strip in coil form. The project consisted of two electric arc furnaces (EAFs) equipped with direct shell evaculation systems and a canopy hood having 100 percent capture efficiency.

(2) CP107-2764-00038, Issued on November 30, 1993 - This PSD modification was performed to increase the steel production rate from 160 tons per hour to 260 tons per hour. A second continuous caster was installed to handle the increase in steel production.

(3) CP107-5235-00038, Issued on June 20, 1996 - This PSD modification was performed to increase the steel production rate from 260 tons per hour to 502 tons per hour. Additional burners were added to the existing equipment to handle the increase in steel production.

(b) The proposed modification consists of the following:

(1) One new strip caster line that will utilize a portion of the molten metal from the existing electric arc furnaces at a maximum rate of 135 tons per hour. The maximum molten metal production rate from the electric arc furnaces shall remain 502 tons per hour. The IDEM used past allowable emissions from the EAFs as the baseline emissions. The baseline emissions were modeled and demonstrated compliance with the air quality standards. As a result of this exercise, the debottleneck from the EAFs results in no net emissions increase (past allowable emissions - future potential emissions). Although the EAFs were evaluated as a debottleneck, BACT does not apply to the EAFs because these facilities will not be modified.

(2) The addition of 18 batch annealing furnaces were originally part of a separate permit application (107-11691-00038) submitted on December 21, 1999. Because the batch annealing furnaces can handle the products from both the existing continuous caster line and the proposed continuous strip caster line described in a second permit application (107-12143-00038) submitted on April 11,2000, it was determined that the two projects were related. Therefore, the equipment associated with permit application 107-11691-00038 was combined with this permit application (107-12143-00038) to determine the level of permitting required.

(3) The addition of one ladle preheater to the existing meltshop. The ladle preheater is used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations.

(4) The addition of one bead blasting system. This bead blasting system is a research and development project which may serve as an alternative cleaning operation to the existing pickle line. The bead blasting system will be situated before the existing pickle line and used in series with the pickle line (PL-2). If the bead blasting system is successful, it may replace the existing pickle line.

This system was originally part of a separate permit application (107-11691-00038) submitted on December 21, 1999. Because the bead blasting system can handle the products from both the existing continuous caster line and the proposed continuous strip caster line described in a second permit application (107-12143-00038) submitted on April 11, 2000, it was determined that the two projects were related. Therefore, the equipment associated with permit application 107-11691-00038 was combined with this permit application (107-12143-00038) to determine the level of permitting required.

Stack Summary

Stack ID	Operation	Height	Diameter	Flow Rate	Temperature
S-20	LMS Baghouse	100	8.5	230,328	150
S-21	LMF Roof Monitor	104	-	-	-
S-22	Bead Blasting	14	2	36,000	Ambient
S-23	Bead Storage Silo	30	0.5	1,000	Ambient
S-24	LMS Dust Silo	90	3.5	100	90
S-28	Cold Mill Roof	79.5	-	-	-
CS-1	Cooling Tower	18.5	14.0	303,000	90
CS-2	Cooling Tower	18.5	14.0	303,000	90
DG-1 - DG-7	Diesel Generators	8.5	0.42	2,140	900

Recommendation

The staff recommends to the Commissioner that the Part 70 Significant Source Modification be approved. This recommendation is based on information derived from this application submitted by the applicant on April 11, 2000. This review also includes information obtained from a separate application (107-11691-00038) submitted by the applicant on December 21, 1999 and determined by IDEM, OAM to be related. As a result, the applications were combined for one review.

Emission Calculations

The emission calculations for the criteria pollutants and hazardous air pollutants (HAPs) are provided in Appendix A.

County Attainment Status

The source is located in Montgomery County.

Pollutant	Status
PM-10	Attainment
SO_2	Attainment
NO_2	Attainment

Ozone	Attainment
CO	Attainment
Lead	Attainment

(a) Volatile organic compounds (VOC) and oxides of nitrogen (NOx) are precursors for the formation of ozone. Therefore, VOC and NO_X emissions are considered when evaluating the rule applicability relating to the ozone standards. Montgomery County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

(b) Montgomery County has been classified as attainment or unclassifiable for all criteria pollutant. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

(c) Since this type of operation is one of the 28 listed source categories under 326 IAC 2-2, the fugitive PM emissions are counted toward determination of PSD applicability.

(d) Under the definition of potential to emit (PTE) in 326 IAC 2-2, secondary emissions from locomotives are not counted toward determination of PSD applicability.

Source Status

Existing Source PSD Definition (emissions after controls, based upon 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	178
PM-10	135
SO_2	222
VOC	261
CO	9755
NOx	14748

(a) This existing source is a major stationary source because an attainment regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the 28 listed source categories.

(b) The diesel engine air compressors shall be restricted to 124,600 gallons of diesel fuel per year. This limitation shall be a federally enforceable condition in the construction permit.

(c) The combustion units, except the tundish preheaters identified as TP-1 and TP-2, associated with this modification shall install low-NOx burners as part of an integral control design to control NOx emissions. preheaters TP-1 and TP-2 shall each be equipped with oxy-fuel burners.

(d) The storage silos associated with this modification shall be equipped with bin vent filters to

control particulate emissions. The particulate emissions from the proposed LMS and continuous caster shall be captured by canopy hoods and side drafts and controlled by a baghouse.

Potential to Emit of Modification After Issuance

(a) The table below summarizes the potential to emit (PTE) for each criteria pollutant, reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification.

Pollutant	PTE (tons/year)	**PSD Significance Levels**
PM	~~47.8~~ **46.3**	**25**
PM-10	~~28.7~~ **28.2**	**15**
SO_2	~~165~~ **112**	**40**
VOC	~~14.8~~ **12.3**	**40**
CO	~~73.9~~ **120**	**100**
NOx	~~130~~ **124.5**	**40**
Pb	~~0.29~~ **0.20**	**0.6**

This modification to an existing major stationary source is major for PSD because the emissions increase of at least one criteria pollutant is greater than its PSD significant threshold level. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements apply. The debottleneck from the EAFs results in no net emissions increase (past allowable emissions - future potential emissions).

(b) The table below summarizes the potential to emit for each hazardous air pollutant (HAP), reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification.

HAP Pollutant	PTE (tons/yr)
Benzene	0.01
Formaldehyde	0.13
Naphthalene	3.38
Toluene	0.02
Hexane	0.01
Xylene	0.002
Propylene	0.02
1,3 Butadiene	0.0003
Acetaldehyde	0.01
Acrolein	0.001
Lead Compounds	~~0.29~~ **0.20**
Total HAPs	**3.77**

This modification is not a major source of HAP emissions because the potential to emit of each HAP is less than the significant threshold level for a single HAP (10 tons per year) and the potential to emit of the total HAPs are less than the significant threshold level for combined HAPs (25 tons per year). Therefore, pursuant to 326 IAC 2-1-3.4, the New Source Toxic Control requirements do not apply.

Justification for Modification

The Part 70 Operating permit is being modified through a Part 70 Significant Source Modification. This modification is being performed pursuant to 326 IAC 2-2 and 2-7-10.5(d)(8).

Federal and State Rule Applicability

326 IAC 1-6 (Malfunctions)
The above facilities are subject to the requirements of 326 IAC 1-6 (Malfunctions) because they are required to obtain an operating permit under 326 IAC 2-1-4

326 IAC 1-7 (Stack Height Provisions)
The LMS stack (S-20) is subject to the requirements of 326 IAC 1-7 (Stack Height Provisions) because the PM emissions exhausting the stack exceed 25 tons per year. This rule requires that the stack be constructed using Good Engineering Practice (GEP), unless field studies or other methods of modeling show to the satisfaction of IDEM that no excessive ground level concentrations, due to less than adequate stack height, will result.

The height of the proposed stack will be less than the GEP stack height. Therefore, a dispersion model to determine the significant ambient air impact area was developed and analysis of actual stack height with respect to GEP was performed. Appendix C discusses the results of the modeling exercise.

326 IAC 2-1-3.4 (New Source Toxic Control)
The New Source Toxics Control rule requires any new or reconstructed major source of hazardous air pollutants (HAPs) for which there is no applicable NESHAP to implement maximum achievable control technology (MACT), determined on a case-by-case basis, when the potential to emit is greater than 10 tons per year of any single HAP or 25 tons per year of any combination of HAP. Indiana presently requests applicants to provide information on emissions of the 187 hazardous air pollutants (listed in the OAM Construction Permit Application, Form Y) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries.

The equipment associated with the proposed modification is not subject to an applicable NESHAP and because the worst case emissions from a single HAP and combined HAPs are less than the major source threshold levels, MACT pursuant to 326 IAC 2-1-3.4 does not apply.

326 IAC 2-2 and 40 CFR 52.21 (Prevention of Significant Deterioration Requirements)
The equipment associated with the proposed modification is subject to the PSD rules for PM, PM-10, SO_2, CO, VOC and NO_x because these attainment pollutants exceed the PSD significant threshold levels reported in 326 IAC 2-2-1. Therefore, the PSD provisions require that this major source be reviewed to ensure compliance with the Best Available Control Technology (BACT) as well as the National Ambient Air Quality Standards (NAAQS) and PSD air quality increments.

The *BACT/LAER Analysis Report*, included in Appendix B, was conducted for the major source PSD pollutants for each process on a case-by-case basis by reviewing similar process controls and new available technologies. The BACT determination is based on the cost per ton of subject pollutant removed, energy requirements, and environmental impacts.

The *Air Quality Analysis Report*, included in Appendix C, was conducted to demonstrate that this major source does not violate the National Ambient Air Quality Standards (NAAQS) and does not exceed the incremental consumption above 80 percent of the PSD increment for any subject pollutant.

326 IAC 2-6 (Emission Reporting)
This source is subject to 326 IAC 2-6 (Emission Reporting) because it has the potential to emit more than 100 tons per year of at least one criteria pollutant. Pursuant to this rule, the owner/operator of this source must annually submit an emission statement of the facility. The annual statement must be received by July 1 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 5-1 (Visible Emissions)
Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

This source will comply with the above limitations by complying with facility-specific BACT opacity limits specified in operating conditions in the permit.

326 IAC 6-3 (Particulate Emission Limitation for Process Operations)
This rule requires that particulate matter (PM) emissions from the following operations to not exceed the following:

Process Operation	Process Weight Rate	326 IAC 6-3 Limit
Strip Caster Line	135 tons steel/hr	54.3 lb PM/hr
Continuous Bead Blasting System	75 tons steel/hr + 1 ton bead blasting rate/hr	69.0 lb PM/hr

(a) The above operations will achieve compliance with this rule by complying with facility-specific BACT limits for PM specified in the operation conditions of the permit.

(b) The above emission limitations were determined using the following equation for processes with a process weight rate of more than 30 tons per hour:

$E = 55.0\ P^{0.11} - 40$ where E = Rate of emission in pounds per hour and
P = Process weight rate in tons per hour

326 IAC 6-4 (Fugitive Dust Emissions)
This source is subject to the requirements of 326 IAC 6-4 (Fugitive Dust Emissions). This rule requires the owner/operator to not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4.

326 IAC 6-5 (Fugitive Particulate Matter Emissions)
This source is subject to the requirements of 326 IAC 6-5 (Fugitive Particulate Matter Emissions) and shall comply with the existing Fugitive Dust Control Plan.

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)
The proposed modification is subject to the requirements of 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations) because it has a potential to emit more than 25 tons of SO_2 per year. However, there are no specific SO_2 limitations that apply to this facility.

326 IAC 8-1-6 (New Facilities; General VOC Reduction Requirement)
The LMS is subject to the requirements of 326 IAC 8-1-6 (New Facilities; General VOC Reduction Requirement) because it has potential emissions more than 25 tons of VOC per year. This rule requires VOC emissions from the LMS to be reduced using the Best Available Control Technology (BACT). VOC emissions from the LMS will be controlled by good combustion practices, which is considered BACT.

326 IAC 9-1 (Carbon Monoxide Emission Limits)
The proposed modification is not subject to the requirements of 326 IAC 9-1 (Carbon Monoxide Emission Limits) because the equipment associated with the modification (i.e., strip caster line, annealing furnaces and continuous bead blasting system) does not fit one of the categories identified in this rule (i.e., petroleum refining, ferrous metal smelters, or refuse incineration and burning equipment). The strip caster line does not include an electric arc furnace which would be defined as a ferrous metal smelter.

326 IAC 12 and 326 IAC 14
There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) or National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this proposed modification.

Compliance Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAM, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also Section D of the permit.

Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The compliance monitoring requirements applicable to this modification are as follows:

(a) The continuous strip caster line has applicable compliance monitoring conditions as specified below:

(1) Daily visible emissions notations of the LMS baghouse stack exhaust shall be performed during normal daylight operations. A trained employee will record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

(2) The Permittee shall record the total static pressure drop across the LMS baghouse at least once per shift when the associated LMS or continuous strip caster is in operation. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the LMS baghouse shall be maintained within the range of 2.0 and 8.0 inches of water or a range established during the most recent compliant stack test. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of the above mentioned range for any one reading.

These monitoring conditions are necessary because the baghouse for the LMS and continuous caster must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations) and 326 IAC 2-2 (PSD Requirements).

(b) The LMS baghouse dust loading silo has applicable compliance monitoring conditions as specified below:

(1) Weekly visible emission notations of the bin vent to the LMS baghouse dust loading silo shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Preventive Maintenance Plan for this unit shall

contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

This monitoring condition is necessary because the bin vent for the silo must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations) and 326 IAC 2-2 (PSD Requirements).

(c) The continuous bead blasting system has applicable compliance monitoring conditions as specified below:

(1) Weekly visible emission notations of the baghouse stack to the continuous bead blasting unit and the bin vent to the bead storage silo shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

(2) The Permittee shall record the total static pressure drop across the baghouse to the continuous bead unit at least once per shift when the associated bead blasting process is in operation. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 4.0 and 10.0 inches of water or a range established during the most recent compliant stack test. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of the above mentioned range for any one reading.

These monitoring conditions are necessary because the baghouse for the continuous bead blasting unit must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations) and 326 IAC 2-2 (PSD Requirements).

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 Significant Source Modification No. 107-12143-00038.

Appendix A: Emission Calculations

Company Name: Nucor Steel
Address: Route 2, Box 311, Crawfordsville, Indiana 46933
CP: 107-12143
Plt ID: 107-00038
Reviewer: Permit Review Section 2

Total Potential to Emit Emissions of Criteria Pollutants from Modification (After Controls and Limits)

Facility	Pollutant, tons/year						
	SO_2	NOx	VOC	PM_{10}	TSP	CO	Pb
Strip Caster Plant							
LMS (stack)	109.4	10.3	5.1	39.0	39.0	42.1	0.01
LMS (fugitive)	1.1	0.10	0.05	4.4	4.4	0.43	0.004
CC (Emissions included in LMS Calcs)	----	----	----	----	----	----	----
Tundish Preheaters	0.031	7.884	0.284	0.294	0.100	4.415	2.63E-05
Tundish Nozzle Preheaters	0.005	0.88	0.05	0.049	0.017	0.736	4.38E-06
Tundish Dryers	0.047	7.88	0.426	0.442	0.150	6.623	3.94E-05
Ladle Preheaters and dryer	0.116	19.71	1.06434	1.10	0.37	16.56	9.86E-05
Refractory Preheaters	0.039	6.57	0.35	0.37	0.12	5.52	3.29E-05
LMS Dust Silo	----	----	----	0.04	0.04	----	----
Paved Areas	----	----	----	0.95	4.85	----	----
Unpaved Areas	----	----	----	2.47	13.68	----	----
Cooling Towers	----	----	----	5.79	5.79	----	----
Existing Meltshop Modifications							
Ladle Preheater	0.039	6.570	0.355	0.368	0.125	5.519	3.29E-05
Other Modifications							
Continuous Blaster Unit	----	----	----	4.05	4.05	----	----
Blasting Media Storage Silo	----	----	----	0.38	0.38	----	----
Batch Annealing Furnaces	0.22	37.84	2.04	2.12	0.72	31.79	1.89E-04
TOTAL EMISSIONS, tons/year	**111.0**	**97.7**	**9.7**	**61.9**	**73.9**	**113.7**	**0.014**
PSD Significant Threshold Levels, tons/year	40	40	40	15	25	100	0.6

Total Potential to Emit Emissions of Hazardous Air Pollutants (HAPs) from Modification (After Controls and Limits)

Facility	Pollutant, tons/year						
	Benzene	Formaldehyde	Hexane	Naphthalene	Toluene	Lead Cmpds	Total HAP
Strip Caster Plant							
LMS	----	----	----	----	----	0.013	0.01
CC (Emissions included in LMS Calcs)	----	----	----	----	----	----	----
Tundish Preheaters	1.08E-04	3.89E-03	9.25E-02	3.14E-05	1.75E-04	2.63E-05	0.10
Tundish Nozzle Preheaters	1.80E-05	6.48E-04	1.54E-02	5.24E-06	2.92E-05	4.38E-06	0.02
Tundish Dryers	1.62E-04	5.83E-03	1.39E-01	4.71E-05	2.63E-04	3.94E-05	0.15
Ladle Preheaters and dryer	2.71E-04	9.72E-03	2.31E-01	7.86E-05	4.38E-04	9.86E-05	0.24
Refractory Preheaters	1.35E-04	4.86E-03	1.16E-01	3.93E-05	2.19E-04	3.29E-05	0.12
LMS Dust Silo	----	----	----	----	----	----	----
Paved Areas	----	----	----	----	----	----	----
Unpaved Areas	----	----	----	----	----	----	----
Cooling Towers	----	----	----	----	----	----	----
Existing Meltshop Modifications							
Ladle Preheater	1.35E-04	4.86E-03	1.16E-01	3.93E-05	2.19E-04	3.29E-05	0.12
Other Modifications							
Continuous Blaster Unit	----	----	----	----	----	----	----
Blasting Media Storage Silo	----	----	----	----	----	----	----
Batch Annealing Furnaces	7.80E-04	2.80E-02	6.66E-01	2.26E-04	1.26E-03	1.90E-04	0.70
TOTAL EMISSIONS, tons/year	**0.00**	**0.06**	**1.38**	**0.00**	**0.00**	**0.014**	**1.45**
HAP Significant Threshold Levels, tons/year	10	10	10	10	10	10	25

Note: Arsenic Compounds, Beryllium Compounds, Cadmium Compounds, Chromium Compounds, Cobalt Compounds, Lead Compounds, Manganese Compounds, Mercury Compounds, Nickel Compounds and Selenium Compounds are all emitted in trace amounts that total less than 0.005 tons per year. Therefore, these were not included in the HAP calculations.

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) DETERMINATION

Source Background and Description

Source Name:	Nucor Steel.
Source Location:	RR 2, Box 311, CR 400 East, Crawfordsville, IN 47933
County:	Montgomery
Significant Source Modification No.:	107-12143-00038
SIC Code:	3312
Permit Reviewers:	Michele M. Williams and Nisha Sizemore

BACT Analysis

The Indiana Department of Environmental Management (IDEM) has performed the following federal BACT review for the proposed strip caster annealing furnaces plant and other miscellaneous modifications to the existing pickle line, meltshop, and continuous caster line to be owned and operated by Nucor Steel located in Crawfordsville, Indiana. This review was performed for the proposed strip caster line rated at a maximum steel production rate of 135 tons per hour. The strip caster line consists of an ladle metallurgy station (LMS), a continuous caster (CC), and associated combustion equipment.

The source is located in Montgomery County which is designated as attainment or unclassifiable for all criteria pollutants. Based upon the emission calculations, the modification exceeds the PSD significant threshold levels stated in 326 IAC 2-2-1 for PM, PM_{10}, NO_2, CO, and SO_2. Therefore, these pollutants were reviewed pursuant to the PSD Program (326 IAC 2-2 and 40 CFR 52.21). The PSD Program requires a BACT review and air quality modeling. BACT is an emission limitation based on the maximum degree of reduction of each pollutant subject to the PSD requirements. In accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft USEPA *New Source Review Workshop Manual*, this BACT analysis takes into account the energy, environmental, and economic impacts on the source. These reductions may be determined through the application of available control techniques, process design, and/or operational limitations. Such reductions are necessary to demonstrate that the emissions remaining after application of BACT will not cause or contribute to air pollution thereby protecting public health and the environment.

The following BACT determinations are based on information obtained from the PSD permit application submitted by Nucor on April 11, 2000, additional documentation provided by Nucor subsequent to the submittal of the application, information submitted by commenters during the two (2) comment periods, and the EPA RACT/BACT/LAER (RBLC) Clearinghouse.

(A) Strip Caster Line

The emissions generated from the strip caster equipment include the ladle metallurgy station and the continuous caster. A BACT discussion of these two facilities of the strip caster line are presented below.

(1) Ladle Metallurgy Station (LMS)

A portion of the molten metal produced by the existing EAFs may be tapped to the new strip caster line at a maximum rate of 135 tons per hour. The molten metal shall be transported by a combination of an overhead crane (inside the existing meltshop) and a Kress carrier (between the meltshop and the strip caster building). The overhead crane transports the molten metal to the ladle metallurgy station (LMS) identified as LMS-2. At the LMS, a sample of the molten steel will be taken and analyzed for its various constituents. Processes occurring at the LMS at various times include the addition of materials to achieve the desired chemistry and temperature, heating with electrodes, argon stirring and lancing, electromagnetic stirring, and desulfurization.

(a) PM/PM_{10} BACT Review for the LMS

There is potential for generation of particulate emissions at the LMS due to the addition of materials, heating with electrodes, argon stirring and lancing, electromagnetic stirring and desulfurization. Fumes from these operations will be captured by the side draft hood.

Evaluation of Control Options

Control Options Evaluated - Four (4) available technologies were evaluated to control filterable particulate emissions from the LMS:

Electrostatic Precipitator (ESP)
High Efficiency Cyclones
High Energy Scrubbers
Fabric Filters (i.e., baghouses)

Technically Infeasible Control Options - The ESP technology is considered technically infeasible for controlling particulate emissions from an LMS because the particulate has a high concentration of iron compounds. ESPs use an electrostatic field to charge particulate matter contained in the gas stream and then attract and collect the particles on a collection surface of opposite charge. While ESPs have a very high removal efficiency (99% or better) for many sources of particulate, the electromagnetic properties of small charged particles of iron compounds in an electric field adhere very strongly to the collection plates of an ESP and are extremely difficult to dislodge. These operational problems drastically lower the efficiency of the ESP.

Technically Feasible Control Options - The fabric filter has the highest removal efficiency of the technically feasible particulate control devices, and is therefore considered BACT. Because a fabric filter has been proposed for the LMS, no further evaluation is necessary.

Evaluation of Capture System

An evaluation of the capture system to be used is also necessary. Some steel mills utilize roof monitors, while others are required to have a closed shop and exhaust all emissions through the baghouse. The use of a close shop is considered to be technically feasible; therefore a cost analysis was completed to determine economic feasibility.

Lack of a roof monitor would necessitate a larger baghouse which could handle the additional airflow needed (950,000 acfm) to exhaust sufficient heat outside the building in order to ensure employee safety. Conservatively assuming that total building enclosure would result in 100% capture, all PM emissions would be controlled by the baghouse. The annualize cost per ton with regards to PM emissions for the installation of such a baghouse are 8,900 dollars per ton of PM removed. This cost is considered to be excessive.

Capture Efficiency BACT Determination - BACT for capture of emissions from the strip caster operation will be a minimum capture efficiency of 99 percent. Compliance with this capture efficiency will be determined by demonstrating compliance with the requirement that visible emissions shall not exceed 3 percent opacity when emitted from any control device, roof monitor or building opening.

Evaluation of Emission Limit

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for PM and PM_{10} on similar operations (EAFs and/or LMSs):

Source Name (Production Capacity)	PM and PM_{10} limit	Control Technology
Arkansas Steel, AK (50 tons/hr)	0.0052 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Gallatin Steel, KY (200 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
IPSCO Steel, IA (164 tons/hr)	0.0025 gr/dscf (filterable and condensible PM_{10})	Negative Pressure Baghouse
NUCOR Steel, Huger, SC (165 tons/hr)	0.0035 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Trico Steel, AL (440 tons/hr)	0.0032 gr/dscf filterable PM/PM_{10}	Negative Pressure Baghouse
Tuscaloosa Steel, AL (160 tons/hr)	0.0035 gr/dscf filterable PM/PM_{10}	Negative Pressure Baghouse
Stafford Railsteel, AK (125 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
NUCOR Steel, AK (475 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
NUCOR-Yamato Steel, AK (350 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Roanoke Electric Steel Company, VA (70 tons/hr)	0.0034 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse

Source Name (Production Capacity)	PM and PM_{10} limit	Control Technology
Mac Steel, AK (86 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Steel Dynamics, Inc., DeKalb Co., IN (400 tons/hr)	0.0032 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Qualitech Steel, IN (135 tons/hr)	0.0032 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
NUCOR Steel, IN (260 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Beta Steel, IN (132 tons/hr)	0.0052 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse

Although cyclone collectors and high energy wet scrubbers are technically feasible particulate control options, a baghouse provides a higher control efficiency. IDEM is not aware of any situations where a cyclone collector or a high energy wet scrubber has been properly operated to effectively control particulate emissions from an LMS.

With respect to baghouse technology, there are two types of design configurations including positive pressure baghouses and negative pressure baghouses, both of which have been used in the steelmaking industry. Positive pressure baghouses operate at internal pressures greater than the atmospheric pressure. Typically, the fans are located before the fabric filters. This allows the fans to pull air from the LMS and push the dust laden air through the fabric filters and into the ambient air via a continuous ridge vent rather than a stack. The discharge area of a ridge vent is on the order of four times that of a single stack.

Negative pressure baghouses operate at internal pressure less than atmospheric. The fans are located after the fabric filters. This allows the fans to pull the gas laden air from the LMS, through the fabric filters, then push the air up through a central stack.

Review of the RBLC indicates that 0.0032 grains per dry standard cubic feet is considered BACT for negative pressure baghouses compared to 0.0018 grains per dry standard cubic feet for positive pressure baghouses. Although there is this distinction, baghouse and bag manufacturer's claim that there is no difference in filtering capability between these types of baghouses. This claim is supported by the following available stack test information for negative pressure baghouses:

Facility	PM/PM10 Limit	Compliance Information
IPSCO Steel, IA Issued on 8/14/96	0.0025 gr/dscf @ 164 tph steel; 0.0033 gr/dscf @ 200 tph steel; 0.0033 gr/dscf @ 230 tph steel (limits represent filt+condens PM/PM10 and are for meltshop operations) (Permit requires tes by Method 5 and 201A with 202)	11/17-19/98 Test: PM (filt): 0.0008 gr/dscf PM10 (condens): 0.0037 gr/dscf @ 62.5 tph steel. State plans to adjust total (filt+condens) PM/PM10 limit up to 0.0045 gr/dscf.

Nucor Steel-Huger, SC Issued on 8/16/95	0.0035 gr/dscf - (filterable PM/PM10) from meltshop operations) (Permit requires testing by Method 5)	8/5-7/97 Test: PM (filt): 0.00107 gr/dscf @ 202 tph steel rate
Trico Steel, AL	0.0032 gr/dscf (filterable PM/PM10)	9/21/98 Test: PM (filt): 0.0015 gr/dscf, 16 lb/hr (Method 5)
Tuscaloosa Steel, AL 12/15/94	0.0035 gr/dscf, 32.5 lb/hr - Use Method 5 Test (filterable PM/PM10) from meltshop operations (Permit requires Method 5)	No Test Data Available for PM
Roanoke Electric Steel, VA 11/6/98	0.0034 gr/dscf TSP (filterable), 9.8 lb/hr PM, 43.1 tpy PM, 7.5 lb/hr PM10, 32.8 tpy PM10 for EAF Only 0.0052 gr/dscf TSP (filterable), 2.8 lb/hr PM, 12.2 tpy PM, 2,8 lb/hr PM10, 12.2 tpy PM10 for LMS Only (Permit requires test, but no method given)	4/30-5/2/97 Test: PM (fiilt) from EAF: 0.001 gr/dscf PM (filt) from LMS: 0.0007 gr/dscf
Steel Dynamics-Butler, IN Issued on 6/25/97 (Mod for 2nd EAF)	0.0032 gr/dscf, 35.7 lb/hr (filterable PM/PM10) from meltshop operations	11/17-20/98 Test: PM (filt): 0.00106 gr/dscf PM10 (filt+condens): 0.00299 gr/dscf @ 319 tph steel production 2/2/99 Test: PM (filt): 0.00034 gr/dscf PM10 (filt+condens): 0.00186 gr/dscf @ 329 tph steel production
Qualitech Steel, IN Issued on 10/31/96	0.0032 gr/dscf, 17.36 lb/hr (filterable PM/PM10) for meltshop operations	9/8/99 Test: 1/15/99 Test: PM (filt): 1.52 lb/hr, 0.0004 gr/dscf @ 97 tph steel rate (Method 5 Used)
Beta Steel, IN Issued on 2/24/92	0.0052 gr/dscf, 58.8 lb/hr, 257 tpy (filterable PM/PM10) for meltshop operations	1/19-27/98 Test: PM (filt): 0.000187 gr/dscf PM10 (condens): 0.00032 gr/dscf @ 151 tpy steel production rate 1/31-2/2/99 Test: PM (filt): 0.0003 gr/dscf PM10 (condens): 0.0045 gr/dscf @ 92 tph steel production rate

Although none of the facilities listed in the table above were limited to 0.0018 gr/dscf for filterable PM/PM10, all of the available stack test data demonstrates compliance with this limitation for filterable PM/PM10. The stack test data also demonstrates compliance with Nucor's total PM/PM10 limit of 0.0052 gr/dscf, including both the filterable and condensible fractions.

Because it is well documented that a negative pressure baghouse can achieve the most stringent BACT limit of 0.0018 gr/dscf for filterable PM/PM10, this limit shall apply to the proposed baghouse for the LMS and CC at Nucor Steel. There has been no change to the permit as a result of this comment.

PM/PM10 BACT Determination - BACT for filterable PM/PM_{10} shall be the use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be limited to 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening.

(b) NOx BACT Review for the LMS

NOx is formed from the chemical reaction between nitrogen and oxygen at high temperatures. NOx formation occurs by different mechanisms. In the case of LMSs, NOx predominantly forms from thermal dissociation and subsequent reaction of nitrogen and oxygen molecules in the combustion air. This mechanism of NOx formation is referred to as thermal NOx. The other mechanisms of NOx formation such as fuel NOx (due to the evolution and reaction of fuel-bound nitrogen compounds with oxygen) and prompt NOx (due to the formation of HCN followed by oxidation to NOx) are thought to have lesser contributions to NOx emissions from LMSs.

Control Options Evaluated - Six (6) available technologies were evaluated to control NOx emissions from the LMS:

Combustion Controls
Selective Catalytic Reduction (SCR)
Non-Selective Catalytic Reduction (NSCR)
GoalLine SCONOx Catalytic Oxidation/Absorption
Shell DeNOx System (modified SCR)
Selective Non-Catalytic Reduction (SNCR) Options:
- Exxon's Thermal DeNOx
- Nalco Fuel Tech's NOxOUT
- Low Temperature Oxidation (LTO)

Technically Infeasible Control Options - Combustion controls are technically infeasible because of the absence of fuel combustion activities at the LMS.

Technically Feasible Control Options - The estimated purchase cost of any control technology unit is expected to be at least $200,000 without considering site-specific costs of installation, operation and maintenance. Given that NOx emissions from the LMS are only 10.4 tons per year, these control options, considering purchase costs alone, are likely to exceed $15,000 per ton of NOx removed. These costs are prohibitive and therefore, these control options are excluded from further consideration in this BACT analysis.

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for NOx on similar operations:

Source	NOx Emission Limit	BACT Control Technology
Trico Steel, AL	0.02 lbs/ton steel	Proper Operation

Roanoke Steel, VA	6 lbs/hr 100 tons steel/hr (0.06 lb/ton steel)	Proper Operation
Nucor-Yamato, AR	0.02 lbs/ton	Proper Operation

The majority of sources exhaust the emissions from the LMS and EAF to a common stack. Only the three sources listed above have separate exhaust system for the LMS. These sources minimize NOx emissions by proper operation of the unit. Nucor Steel proposes to minimize NOx emissions by proper operation of the unit, which is consistent with BACT determinations for similar sources.

NOx BACT Determination - BACT for NOx from the LMS shall be proper operation and shall not exceed a NOx emission rate of 0.0176 pounds per ton of steel produced. This limit is based on the results of stack tests performed at Nucor on their existing LMS. This limitation is more restrictive than BACT determinations for similar sources.

(c) SO_2 BACT Review for the LMS

The source of SO_2 emissions from the LMS is attributable to the sulfur content of the raw materials added to the LMS, and residual sulfur carried over in the molten metal matrix from the melting and refining process.

Control Options Evaluated - The following available technologies were evaluated to control SO2 emissions from the LMS:

Flue Gas Desulfurization (FGD) Options:
- Spray Dryer Absorption (SDA)
- Wet Scrubbing
- Dry Sorbent Injection (DSI)

Technically Feasible Control Options - None of these SO_2 control technologies have been applied to an LMS; however, these controls options have been successfully implemented on utility boilers. Because this technology has been successfully applied to utility boilers, the technology could be transferred and applied to an LMS, which is known as a technology transfer. However, the SO_2 control efficiencies are significantly impaired due to the relatively large gas flow rate, low SO2 concentrations in the gas stream, large temperature fluctuations and variability resulting from a batch operation. The following summary outlines the economic feasibility of these technically feasible control options:

Control Option	Control Efficiency (%)	Total SO_2 Emissions (tons/yr)	SO_2 Emissions Removed (tons/yr)	Total Annual Cost ($)	Annualized Cost ($/ton SO_2 removed)
SDA	45	109.4	49.2	968,000	19,700
Wet Scrubbing	35	109.	38.3	746,000	19,500
DSI	25	109.4	27.4	418,000	15,300

The above total and annualized costs are based on the cost estimating structure and guidance provided in the USEPA reference, "OAQPS Cost Control Manual", Fifth Edition, EPA 453/B-96-001 (February 1996), other relevant information provided by the respective equipment vendors, inputs from mill personnel and engineering judgment. The various cost factors are based on guidance provided under OAQPS Manual Chapter 9 - Gas Absorbers. Since SO2 control technologies are not specifically covered in the OAQPS Manual, the chapter under Gas Absorbers was adopted as being appropriate.

Based on the information presented above, these technically available control options are not economically feasible.

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes other BACT determinations for SO2 on similar operations (LMSs):

Source	SO_2 Limit	BACT Control Technology	Compliance Status
Trico Steel, AL	None	None	N/A
Roanoke Steel, VA	6.0 lb/hr 100 tons steel/hr (0.06 lb/ton steel)	None	1.14 lb/hr
Nucor- Yamato, AR	0.36 lb/ton	None	Information Not Available

The majority of sources exhaust the emissions from the LMS and EAF to a common stack. Only the three sources listed above have separate exhaust system for the LMS. None of these facilities have applied SO2 control technologies to an LMS. In addition, SO2 control technologies have not been applied to the combined exhaust of electric arc furnaces (EAFs) and LMSs, a larger SO2 emission source.

Nucor Steel calculated the SO2 emissions from the LMS using internal stack test data from its existing LMS. Because the molten steel from the existing EAF shall serve both the existing LMS and the proposed LMS, the SO2 emissions are expected to be the same.

SO2 BACT Determination - BACT for SO2 from the LMS shall meet an emission rate of 0.185 pounds SO2 per ton of steel produced. This limit is based on the results of stack testing performed at Nucor on their existing LMS.

(d) CO BACT Review for the LMS

CO will be emitted as a byproduct of incomplete or inefficient combustion of the molten matrix in the LMS. Typically, CO emissions from combustion sources depend on the oxidation efficiency of the fuel. By controlling the combustion process carefully, CO emissions can be minimized. Also, smaller combustion units tend to emit more CO than

comparable larger units because smaller units usually have a higher ratio of heat transfer surface area to flame volume than larger combustors. This leads to reduced flame temperature and combustion intensity, and therefore lower combustion efficiency. CO emissions result when there is an insufficient residence time at high temperature to complete the final step in hydrocarbon oxidation. However, in the context of a LMS, CO emissions are predicated by residual incomplete oxidation reactions of matrix constituents during alloying operations.

Control Options Evaluated - Six (6) available technologies were evaluated to control CO emissions from the LMS:

(1) Fuel Spec: Clean-Burn Fuel;
(2) Good Combustion Practices;
(3) Flaring of CO Emissions;
(4) Low CO Burners;
(5) CO Oxidation Catalysts; and
(6) Post-Construction Reaction Chamber.

Technically Infeasible Control Options

Fuel Spec: Clean-Burn Fuel and Good Combustion Practices - Combustion controls are technically infeasible because of the absence of fuel combustion activities at the LMS.

Flaring - The OAQ has found no known applications of flaring for similar LMS exhaust gases for CO control. Flaring of emissions for CO destruction would require raising the exhaust gas temperature to 1300 degrees Fahrenheit at a residence time of 0.5 second. Presently, the exhaust gas stream is around 200,000 dscfm at 150 degrees Fahrenheit. Thus, based on the relatively large gas volumetric flow at a substantial temperature differential, the auxiliary fuel requirements needed to operate the flare would be overwhelmingly large. Additionally, it can be speculated as to whether the flare would actually result in a decrease of CO emissions or increase thereof from supplemental fuel combustion. Supplemental fuel combustion would also result in an increase in NOx emissions. Consequently, flaring is considered to be technically infeasible.

CO Oxidation Catalysts - The OAQ has found no known applications of CO oxidation catalysts to control CO emissions from a steel mill LMS. The optimal working temperature range for CO oxidation catalysts is approximately 850 to 1100 degrees Fahrenheit with a minimum exhaust gas stream temperature of 500 degrees Fahrenheit for minimally acceptable CO control. Exhaust gases from the LMS will undergo rapid cooling as they are ducted from the furnace configuration. Thus, the temperature will be below the minimum 500 degrees Fahrenheit threshold for effective operation of CO oxidation catalysts. Additionally the particulate matter in the gas stream is anticipated to be a detriment to efficient operation of a CO oxidation catalyst. Masking effects such as plugging and coating of the catalyst would almost certainly result in impractical maintenance requirements, and would significantly degrade the performance of the catalyst. Consequently, this control alternative is not considered technically feasible.

Post-Combustion Reaction Chambers - The OAQ has found no known applications of post combustion reaction chambers to control CO emissions from a steel mill LMS. Due to the

heat and particulate loading, the burners would have a short life expectancy, and may sustain severe maintenance and reliability problems. Additionally, a single or multiple duct burner system would not be able to heat the relatively cool gases from the LMS during cold cycling. Consequently, this control alternative is not considered technically feasible.

Catalytic incineration - The OAQ has found no known applications of catalytic incineration to control CO emissions from a steel mill LMS. Catalytic incineration systems are subject to potential poisoning, deactivation, and/or blinding of the catalyst. Lead, arsenic, vanadium, and phosphorus are generally considered poisons to catalysts and deactivate the available reaction sites on the catalyst surface. Particulate can also build up on the catalyst, effectively blocking the porous catalyst matrix and rendering the catalyst inactive. Due to the potentially adverse issues with catalyst blocking and poisoning with this application, this technology is not considered technically feasible.

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for CO on similar operations:

Source	NOx Emission Limit	BACT Control Technology
Trico Steel	0.3 lbs/ton steel	Proper Operation
Roanoke Electric Steel, VA	48 lbs/hr 100 tons steel/hr (0.48 lb/ton steel)	Proper Operation
Roanoke Electric Steel, VA	120 tons/yr 500,000 tons steel/yr (0.48 lb/ton steel)	Proper Operation
Nucor-Yamato, AR	0.14 lbs/ton	Proper Operation
Tuscaloosa Steel Corp.	32 lbs/hr 160 tons steel/hr (0.2 lb/ton steel)	Proper Operation

The majority of sources exhaust the emissions from the LMS and EAF to a common stack. Only the sources listed above have separate exhaust systems for the LMS. These sources minimize CO emissions by proper operation of the unit.

Nucor Steel proposes to minimize CO emissions by proper operation of the unit, which is consistent with BACT determinations for similar sources. Nucor Steel calculated the CO emissions from the LMS using internal stack test data from its existing LMS. Because the molten steel from the existing EAF shall serve both the existing LMS and the proposed LMS, the CO emissions are expected to be the same.

CO BACT Determination - BACT for CO from the LMS shall be proper operation and shall not exceed a CO emission rate of 0.07125 pounds per ton of steel produced. This limit is based on the results of stack tests performed at Nucor on their existing LMS. This limitation is more restrictive than BACT determinations for similar sources.

(2) Continuous Caster (CC)

The caster will form a solid continuous slab of steel as molten metal passes through a set of water-cooled rolls. The caster uses a set of water-cooled rolls that are replaced or adjusted depending upon product type. Particulate matter is the only pollutant generated from this operation from the casting of hot metal. Therefore, BACT was only performed for particulate matter.

(a) PM/PM_{10} BACT Review for the CC

PM and PM_{10} emissions may be generated during the casting of hot metal. However, the emissions will be captured by a roof canopy and evacuated to the LMS baghouse (S-20). Uncontrolled emissions (estimated at 2%) will be emitted through the LMS roof monitor (S-21).

PM/PM10 BACT Determination - BACT for filterable PM/PM_{10} shall be the use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be limited to 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening.

(3) Combustion Sources from the Strip Caster Plant

The strip caster line shall utilize the following combustion sources:

Two (2) natural gas-fired ladle preheaters (LP-1 and LP-2)(15 MMBtu/hr)
One (1) natural gas-fired ladle dryer (LD-1)(15 MMBtu/hr)
Two (2) natural gas-fired tundish preheaters (TP-1 and TP-2) (6 MMBtu/hr each)
Two (2) natural gas-fired tundish nozzle preheaters
(TNP-1 and TNP-2)(1 MMBtu/hr each)
Two (2) natural gas-fired tundish dryers (TD-1 and TD-2) (9 MMBtu/hr each)
Refractory (transition piece) preheaters (15 MMBtu/hr total)

(a) PM/PM_{10}, SO_2, CO, and NO_x BACT for Combustion Sources

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Control Options Evaluated - Add-on controls are considered impractical due to the small amount of PM/PM_{10}, SO_2, CO, and NO_x that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Technically Infeasible Control Options - The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. Information from vendors indicates that ultra-low NOx burners would be infeasible; therefore, this technology is not considered technically feasible.

Technically Feasible Control Options - Low NOx burners have been required for the combustion sources, with the exception of the tundish preheaters. The tundish preheaters will use oxy-fuel burners because of the more intense heat needed to quickly return the tundishes to operation. Because the tundish preheaters must heat the tundish at a rapid rate, the heat generated from this process creates additional NOx emissions.

Information from vendors indicates that low-NOx burners with NOx emissions less than 0.1 MMBtu/hour is not feasible for these particular applications.

BACT Determination - BACT for the tundish preheaters shall be the use of natural gas fuel and oxy-fuel burners with an emission rate of 0.15 lb NOx/MMBtu. BACT for all other combustion sources shall be the use of natural gas fuel and low-NOx burners with an emission rate of 0.10 lbs NOx/MMBtu.

(4) One (1) LMS Dust Loading Silo

Particulate emissions will be generated during loading of the storage silo. As the LMS dust is conveyed and dropped at the top section of the silo, air will be displaced and exhausted through an opening on top of the silo.

PM/PM10 BACT Determination - A bin vent filter will control the PM and PM10 emissions from the LMS dust storage silo. The bin vent filter will have an outlet grain loading of 0.01 grains per dry standard cubic feet at a maximum volumetric air flow rate of 100 standard cubic feet per minute.

(5) Additional Transport on Paved Roadways and Parking Lots

The new strip caster plant will utilize new and existing paved roadways for transportation of raw materials, products, as well as employees and miscellaneous vendors. The force of the truck and car wheels may pulverize materials on the roadways. The pulverized material will then be lifted and dropped from the rolling wheels. Additionally, the road surface is exposed to the turbulent wake of passing vehicles. These physical actions can result in particulate emissions.

PM/PM10 BACT Determination - At a minimum, the approved site-specific fugitive dust control plan for paved areas to be implemented by Nucor Steel and/or contractors to Nucor Steel shall require posted speed limits around paved areas and vacuuming/sweeping paved roadways and parking lots every 14 days, such that the paved surface silt loading does not exceed 16.8 pounds of silt per mile and the average instantaneous opacity does not exceed 10 percent.

The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation.
(2) The second reading will be taken five (5) seconds later.
(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Method 9. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway or parking lot.

(6) Unpaved Areas around Existing Raw Material Storage Piles

Areas around the new and existing raw material storage piles will be unpaved. The force of the truck or front-end loaders may pulverize materials on the roadways. The pulverized material will then be lifted and dropped from the rolling wheels. These physical actions can result in particulate emissions.

PM/PM10 BACT Determination - At a minimum, the approved site-specific fugitive dust control plan for unpaved areas to be implemented by Nucor Steel and/or contractors to Nucor Steel shall require posted speed limits around unpaved areas and application of an IDEM-approved dust suppressant at a rate of 0.16 gallons per square yard by plant personnel such that fugitive dust emissions are reduced by at least 90 percent instantaneous control and the average instantaneous opacity does not exceed 10 percent.

The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation.
(2) The second reading will be taken five (5) seconds later.
(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Method 9. Each reading shall be taken approximately four (4) feet above the surface of the unpaved roadway or parking lot.

(B) Existing Meltshop Modifications/Additions

(1) Ladle Preheater

One (1) additional natural gas-fired ladle preheater at the existing meltshop, with a maximum heat input rate of 15 MMBtu/hr, will be used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations. All emissions generated from this natural gas-fired combustion source are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Control Options Evaluated - Add-on controls are considered impractical due to the small amount of PM/PM_{10}, SO_2, CO, and NO_x that will be emitted, small size of the burner, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from small combustion sources. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Technically Infeasible Control Options - The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation.

Technically Feasible Control Options - Low NOx burners have been required for these types of combustion sources. The achievable emission rate of the low NOx burners varies depending on the type of operation. Information from vendors indicates that an emission rate of 0.1 is achievable for this particular type of operation.

BACT Determination - BACT for the ladle preheater shall be the use of natural gas fuel and low-NOx burners with an emission rate of 0.10 lbs NOx/MMBtu.

(2) Continuous Blasting Unit

Particulate emissions will be generated during the blasting of blasting media onto the steel surface. The blasting media will be recovered by a cyclone and particulate will be controlled by a baghouse.

PM/PM10 BACT Determination - BACT shall be the use of a cyclone for product recovery and a baghouse for control of the PM and PM_{10} emissions from the blasting media storage silo. The baghouse shall not exceed an outlet grain loading of 0.003 grains per dry standard cubic feet at a maximum volumetric air flow rate of 36,000 standard cubic feet per minute.

(3) Blasting media Storage Silo

Particulate emissions will be generated during loading of the blasting media storage silo. As material is conveyed and dropped at the top section of each silo, air will be displaced and exhausted through an opening on top of the silo.

PM/PM10 BACT Determination - BACT shall be the use of a bin vent filter to control the PM/PM10 emissions from the blasting media storage silo. The bin vent filter shall not

exceed an outlet grain loading of 0.01 grains per dry standard cubic feet at a maximum volumetric gas flow rate of 1,000 standard cubic feet per minute.

(C) Modifications serving both Existing Meltshop and Proposed Strip Caster Line

(1) Batch Annealing Furnaces

Eighteen (18) natural gas-fired batch annealing furnaces, each with a maximum heat input rate of 4.8 MMBtu per hour and have the capability to utilize propane as a backup fuel, will handle product from both the existing continuous caster line and the continuous proposed strip caster line. All emissions from these natural gas-fired combustion sources are products of combustion.

(a) NOx BACT Review for the Batch Annealing Furnaces

Control Options Evaluated - Add-on controls are considered impractical due to the small amount of PM/PM_{10}, SO_2, and NO_x that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Technically Infeasible Control Options - The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. Ultra-low NOx burners are designed to work reliably and efficiently at temperatures typically above 1400 to 1450 degrees Fahrenheit. Below such temperatures these burners are inefficient and produce NOx emissions at higher levels than low NOx burners. Due to the nature of the batch annealing process, the furnace is required to control a temperature cycle with the majority of the time at lower temperatures and/or reduced load. Due to the process related cycling and the limited effective temperature range of the ultra low-NOx burner, the use of ultra low-NOx burners for the batch annealing furnaces is considered infeasible. Additionally the use of ultra low-NOx burners with the required sub stoichiometric and flameless combustion can in theory cause undesired carburization and premature failure of the costly stainless steel inner covers.

Technically Feasible Control Options - Low NOx burners have been applied to these types of combustion sources. The emission rate of the low NOx burners has varied depending on the type of operation. Two vendors were found to offer burners guaranteeing NOx emissions of 0.049 lb/MMBtu for use in these types of batch annealing furnaces. Only one facility was found which utilizes this type of burners in a batch annealing furnace and that facility was not required to perform any compliance demonstration. As a result, the vendor's claim of achieving these lower NOx emissions with their burners, is unproven. Regardless, a cost analysis was completed to determine the annualized cost of the lower-emitting burners per ton of NOx reduced (as compared to regular burners). The lower of the two costs was $13,600 per ton of NOx reduced. This cost is considered to be excessive.

BACT Determination - BACT for the annealing furnaces shall be the use of natural gas fuel and low-NOx burners with an emission rate of 0.10 lbs NOx/MMBtu.

(b) CO BACT Review for the Batch Annealing Furnaces

CO will be emitted as a byproduct of incomplete or inefficient combustion of natural gas in the annealing furnaces. Typically, CO emissions from combustion sources depend on the oxidation efficiency of the fuel. By controlling the combustion process carefully, CO emissions can be minimized. Also, smaller combustion units tend to emit more CO than comparable larger units because smaller units usually have a higher ratio of heat transfer surface area to flame volume than larger combustors. This leads to reduced flame temperature and combustion intensity, and therefore lower combustion efficiency. CO emissions result when there is an insufficient residence time at high temperature to complete the final step in hydrocarbon oxidation.

Control Options Evaluated - Six (6) available technologies were evaluated to control CO emissions from the Batch Annealing Furnaces:

(1) Fuel Spec: Clean-Burn Fuel;
(2) Good Combustion Practices;
(3) Flaring of CO Emissions;
(4) Low CO Burners;
(5) CO Oxidation Catalysts; and
(6) Post-Combustion Reaction Chamber.

Technically Infeasible Control Options

Flaring - The OAQ has found no known applications of flaring for similar annealing furnace exhaust gases for CO control. Flaring of emissions for CO destruction would require raising the exhaust gas temperature to 1300 degrees Fahrenheit at a residence time of 0.5 second. Presently, the exhaust gas stream is around 86,400 dscfm at 150 degrees Fahrenheit. Thus, based on the relatively large gas volumetric flow at a substantial temperature differential, the auxiliary fuel requirements needed to operate the flare would be overwhelmingly large. Additionally, it can be speculated as to whether the flare would actually result in a decrease of CO emissions or increase thereof from supplemental fuel combustion. Supplemental fuel combustion would also result in an increase in NOx emissions. Consequently, flaring is considered to be technically infeasible.

CO Oxidation Catalysts - The OAQ has found no known applications of CO oxidation catalysts to control CO emissions from a steel mill annealing furnace. The optimal working temperature range for CO oxidation catalysts is approximately 850 to 1100 degrees Fahrenheit with a minimum exhaust gas stream temperature of 500 degrees Fahrenheit for minimally acceptable CO control. Exhaust gases from the annealing furnaces will undergo rapid cooling as they are ducted from the furnace configuration. Thus, the temperature will be below the minimum 500 degrees Fahrenheit threshold for effective operation of CO oxidation catalysts. Consequently, this control alternative is not considered technically feasible.

Post-Combustion Reaction Chambers - The OAQ has found no known applications of post combustion reaction chambers to control CO emissions from a steel mill annealing furnace. Due to the heat and particulate loading, the burners would have a short life expectancy, and may sustain severe maintenance and reliability problems. Additionally, a single or multiple duct burner system would not be able to heat the relatively cool gases from the annealing furnaces during cold cycling. Consequently, this control alternative is not considered technically feasible.

Catalytic Incineration - The OAQ has found no known applications of catalytic incineration to control CO emissions from a steel mill annealing furnace. Catalytic incineration systems are subject to potential poisoning, deactivation, and/or blinding of the catalyst. Lead, arsenic, vanadium, and phosphorus are generally considered poisons to catalysts and deactivate the available reaction sites on the catalyst surface. Particulate can also build up on the catalyst, effectively blocking the porous catalyst matrix and rendering the catalyst inactive. Due to the potentially adverse issues with catalyst blocking and poisoning with this application, this technology is not considered technically feasible.

Technically Feasible Control Options -

The OAQ has found no known applications of low CO burners to reduce CO emissions from a steel mill annealing furnace. One application of low CO burners was found to have been used in the steel industry for reheat furnaces; however, the resultant CO emissions were only 8 percent lower than the CO emission rate proposed by Nucor for the proposed annealing furnaces in this application. In view of the modest reduction expected to occur from the use of CO burners, the cost of this control option would be prohibitive.

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. Only one entry was found in the RBLC for annealing furnaces; and that entry was for Nucor. The RBLC entry indicated that the CO emission limit was 35 lb/MMCF; however, after further inquiry, the OAQ found that the entry was a misprint and the current permit limit is actually 400 lb/MMCF, or 0.392 lb/MMBtu. No control methods were required. The OAQ searched for other permits for annealing furnaces and found that, other than requiring the use of natural gas fuel and good combustion practices, no control technologies for CO abatement have been required.

CO BACT Determination - BACT for CO from the annealing furnaces shall be the use of natural gas combustion with good combustion practices per manufacturer's guidance to meet a CO emission limit of 0.084 lb/MMBtu. This limitation is more restrictive than BACT determinations for similar sources.

Nucor Steel **CP 107-12143**
Crawfordsville, IN **Plt ID 107-00038**

Air Quality Analysis

Introduction

Nucor Steel has applied for a Prevention of Significant Deterioration (PSD) permit to construct and operate a strip caster plant in Crawfordsville, IN in Montgomery, County, Indiana. The site is located at Universal Transverse Mercator (UTM) coordinates 514765.0 East and 4424987.0 North. The facility would consist of a strip caster plant at its Crawfordsville, Indiana plant in Montgomery County. Montgomery County is designated as attainment for the National Ambient Air Quality Standards. These standards for Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Carbon Monoxide (CO), Particulate Matter less than 10 microns (PM_{10}), Lead (Pb), and Ozone (O_3) are set by the United States Environmental Protection Agency (U.S. EPA) to protect the public health and welfare.

URS Corporation prepared the PSD permit application for Nucor Steel. The original permit application was received by the Office of Air Management (OAM) on April 11, 2000 with revised application and modeling received on July 7, 2000 and August 29, 2000. This document provides OAM=s Air Quality Modeling Section's review of the PSD permit application and air quality analysis.

Air Quality Analysis Objectives

The OAM review of the air quality impact analysis portion of the permit application will accomplish the following objectives:

A. Establish which pollutants require an air quality analysis based on source emissions.
B. Determine the ambient air concentrations of the source's emissions and provide analysis of actual stack height with respect to Good Engineering Practice (GEP).
C. Demonstrate that the source will not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) or Prevention of Significant Deterioration (PSD) increment.
D. Perform an analysis of any air toxic compound for the health risk factor on the general population.
E. Perform a brief qualitative analysis of the source's impact on general growth, soils, vegetation, endangered species and visibility in the impact area with emphasis on any Class I areas. The nearest Class I area is Kentucky's Mammoth Cave National Park, which is 410 kilometers from the Nucor Steel site in Crawfordsville, Indiana.

Summary

Nucor Steel has applied for a PSD construction permit to construct and operate a strip caster plant in Crawfordsville, Indiana in Montgomery County, Indiana. The PSD application was prepared by URS Corporation in Rolling Meadows, Illinois. Montgomery County is currently designated as attainment for all criteria pollutants. Emission rates of four pollutants (Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2) and Particulate Matter less than 10 microns (PM_{10})) associated with the facility exceeded significant emission rates established in state and federal law, thus requiring air quality modeling. Modeling results taken from the Industrial Source Complex Short Term (ISCST3) model showed pollutant impacts for NO_2, SO_2 and PM_{10} were predicted to be greater than the significant impact for purposes of a National Ambient Air Quality Standards analysis. The air quality modeling showed no violations of the NAAQS for NO_2, PM_{10}, and SO_2. Analysis for PSD increment consumption was necessary for NO_2, SO_2, and PM_{10}. Results from the PSD increment analysis showed increment consumption above 80% of the available PSD increment for PM_{10}. However, Nucor Steel had no significant impact on any receptors with concentrations above the available PSD increment. Hazardous Air Pollutant (HAPs) modeling and all HAP 8-hour maximum concentrations modeled below 0.5% of each Permissible Exposure Limit (PEL). There was no impact

review conducted for the nearest Class I area, which is Mammoth Cave National Park in Kentucky. No Class I analysis is required if a source is located more than 100 kilometers (61 miles) from the nearest Class I area. An additional impact analysis on the surrounding area was conducted and no significant impact on economic growth, soils, vegetation, federal and state endangered species or visibility from the Nucor Steel plant was expected.

Part A - Pollutants Analyzed for Air Quality Impact

Indiana Administrative Code (326 IAC 2-2) PSD requirements apply in attainment and unclassifiable areas and require an air quality impact analysis of each regulated pollutant emitted in significant amounts by a new major stationary source or modification. Significant emission levels for each pollutant are defined in 326 IAC 2-2-1. CO, NO_x, SO_2, VOCs and PM_{10} will be emitted from Nucor Steel and an air quality analysis is required for CO, NO_x , SO_2, and PM_{10}, all of which exceeded their significant emission rates as shown in Table 1. It should be noted that all emissions are based on the Best Available Control Technology (BACT) determination and other limitations resulting from the OAM review of the application.

TABLE 1 – Nucor Steel Significant Emission Rates (tons/yr)

Pollutant	Maximum Allowable Emissions	Significant Emission Rate
CO	120.7	100.0
NO_x	135.4	40.0
SO_2	113.6	40.0
PM_{10}	39.1	15.0
VOC	12.7	40.0

Significant emission rates are established to determine whether a source is required to conduct an air quality analysis. If a source exceeds the significant emission rate for a pollutant, air dispersion modeling is required for that specific pollutant. A modeling analysis for each pollutant is conducted to determine whether the modeled concentrations would exceed significant impact increments. Modeled concentrations below significant impact increments are not required to conduct further air quality modeling. Modeled concentrations exceeding the significant impact increment would be required to conduct more refined modeling which would include source inventories and background data. These procedures are defined in AGuidelines for Air Quality Maintenance Planning and Analysis, Volume 10, Procedures for Evaluating Air Quality Impacts of New Stationary Sources@ October 1977, U.S. EPA Office of Air Quality Planning and Standards (OAQPS).

Part B - Significant Impact Analysis

An air quality analysis, including air dispersion modeling, was performed to determine the maximum concentrations of the source emissions on receptors outside of the facility property lines. A worst-case approach for emission estimates has been taken due to the nature of the operational capability of the facility.

Model Description

The Office of Air Management review used the Industrial Source Complex Short Term (ISCST3) model, Version 3, dated April 10, 2000 to determine maximum off-property concentrations or impacts for each pollutant. All regulatory default options were utilized in the United States Environmental Protection Agency (U.S. EPA) approved model, as listed in the 40 Code of Federal Register Part 51, Appendix W

AGuideline on Air Quality Models@. The Auer Land Use Classification scheme was referred to determine the land use in a 3 kilometer (1.9 miles) radius from the source. The area is considered primarily agricultural with a portion of the area classified as industrial, therefore a rural classification was used. The model also utilized the Schulman-Scire algorithm to account for building downwash effects. The stacks associated with the proposed facility are below the Good Engineering Practice (GEP) formula for stack heights. This indicates wind flow over and around surrounding buildings can influence the dispersion of concentrations emitted from the stack. 326 IAC 1-7-3 requires a study to demonstrate that excessive modeled concentrations will not result from stacks with heights less than the GEP stack height formula. These aerodynamic downwash parameters were calculated using U.S. EPA=s Building Profile Input Program (BPIP).

Meteorological Data

The meteorological data used in the ISCST3 model consisted of the latest five years of available surface data from the Indianapolis, Indiana National Weather Service station merged with the mixing heights from Peoria, Illinois Airport National Weather Service station. The 1990-1994 meteorological data was purchased through the National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) and preprocessed into ISCST3-ready format with U.S. EPA=s PCRAMMET.

Receptor Grid

Ground-level points (receptors) surrounding the source are input into the model to determine the maximum modeled concentrations that would occur at each point. OAM modeling utilized a discrete receptor grid out to 10 kilometers (6.1 miles) for all pollutants. A total of 1751 receptors were used in the modeling analysis. Receptors were placed at 100 meter spacing around plant property lines.

Modeled Emissions Data

The modeling used the emission rates listed in Table 2-1 of the application and was reviewed and revised by OAM. Research and communication with U.S. EPA and other states during the review has led to revisions from the Nucor Steel submittal in the OAM modeling review. OAM modeling results reflect these emissions and are considered the controlling results for this air quality analysis.

Modeled Results

Maximum modeled concentrations for each pollutant over its significant emission rate are listed below in Table 2 and are compared to each pollutant=s significant impact increment for Class II areas, as specified by U.S. EPA in the Federal Register, Volume 43, No. 118, pg 26398 (Monday, June 19, 1978).

TABLE 2 - Summary of OAM Significant Impact Analysis (ug/m^3)

Pollutant	Year	Time-Averaging Period	Nucor Maximum Modeled Impacts	Significant Impact Increments	Significant Monitoring Levels
CO	1991	1-hour	164.0	**2000**	[a]
CO	1993	8-hour	55.2	**500**	575
PM_{10}	1990	24-hour	16.3	**5**	10
PM_{10}	1991	Annual	3.5	**1**	[a]
NO_2	1990	Annual	6.3	**1**	14
SO_2	1990	3-hour	111.7	**25**	[a]

SO_2	1992	24-hour	33.8	**5**	13
SO_2	1991	Annual	2.9	**1**	[a]

[a] No limit exists for this time-averaged period

Background Concentrations

Modeling results indicate that of the pollutants which exceeded significant emission rates (CO, NO_2, PM_{10}, and SO_2) impacts were above pre-construction monitoring de minimis levels specified in 326 IAC 2-2 for PM_{10}, and SO_2. Table 3 below shows the monitoring data used for meeting the pre-construction requirement. Nucor Steel has satisfied the pre-construction monitoring requirement, using PM_{10} monitoring data, considered conservative of the area, from the Blanford monitor in Vermillion County and SO_2 monitoring data from the Fountain County monitor located north of State Road 234 East.

Background concentrations for use in the NAAQS analysis were required since the results of the modeling for NO_2, SO_2 and PM_{10} concentrations exceeded their significant impact increments. The background concentrations are listed below in Table 3.

TABLE 3 - Background Concentrations (ug/m^3)

Pollutant	**Monitor Location**	**Time-Averaging Period**	**Monitored Concentrations**
NO_2	Naval Avionics Center, Indy	Annual	33.8
SO_2	North of State Road 234 East	2nd highest 3-hour	414.8
SO_2	North of State Road 234 East	2nd highest 24-hour	99.6
SO_2	North of State Road 234 East	Annual	31.4
Pb	Rockville Rd., Marion County	Calendar Quarter	0.061
PM_{10}	Blanford, Vermillion County	2nd highest 24-hour	41.3
PM_{10}	Blanford, Vermillion County	Annual	21.0

Part C - Analysis of Source Impact on NAAQS and PSD Increment

NAAQS Compliance Analysis and Results

Emission inventories of NO_2, SO_2 and PM_{10} sources in Indiana within a 50 kilometer radius of Nucor Steel, taken from the OAM emission statement database as required by 326 IAC 2-6, were supplied to the consultants. EPA and OAM have approved a screening method, using the ISCST3 model, to eliminate NO_2, SO_2, and PM_{10} NAAQS sources and NO_2, SO_2 and PM_{10} PSD sources from the inventory that have no significant impact in the source significant impact area for each pollutant. This method modeled all NO_2, SO_2, and PM_{10} NAAQS and PSD sources in the 50 kilometer radius from the site. Any source that has modeled concentrations less than the significant impact increment in the significant impact area of Nucor Steel was removed from the NAAQS and PSD inventories. Sources, which did not screen out of the NAAQS and PSD inventories were included in the NO_2, SO_2, and PM_{10} refined air quality modeling. A summary of the screening results is listed in the permit application.

NAAQS modeling was conducted to compare to each pollutant=s respective NAAQS limits. OAM modeling results are shown in Table 4. All maximum concentrations of NO_2, SO_2 and PM_{10} for every time-averaged period were below their respective NAAQS limit and further modeling was not required.

TABLE 4 - National Ambient Air Quality Standards Analysis (ug/m^3)

Pollutant	Year	Time-Averaging Period	Modeled Source Impacts	Background	Total	NAAQS Limits
NO_2	1990	Annual	14.9[a]	33.8	53.7	100.0
Pb	1992	Calendar Quarter	0.007	0.061	0.068	1.5
PM_{10}	1994	Highest 2nd high 24-hour	28.2	41.3	69.5	150.0
PM_{10}	1990	Annual	5.6	21.0	26.6	50.0
SO_2	1990	Highest 2nd high 3-hour	137.1	414.8	551.9	1300.0
SO_2	1990	Highest 2nd high 24-hour	52.1	99.6	151.7	365.0
SO_2	1992	Annual	5.6	31.4	37.0	80.0

[a] Includes the NO_x/NO_2 ratio of 0.75 cited in 40 CFR 51, Appendix W Guideline on Air Quality Modeling.

Particulate Matter less than 2.5 micron

U.S. EPA issued a new National Ambient Air Quality Standard for Particulate Matter less than 2.5 microns ($PM_{2.5}$) on July 17, 1997. Due to a legal challenge to the new standard, however, U.S. EPA has released specific guidance stating that states should continue to analyze PM_{10} impacts for all New Source Review. There are 3 primary origins of $PM_{2.5}$: 1) primary particulates in the solid state, 2) condensible particulates and 3) secondary particulates formed through atmospheric reactions of gaseous precursor emissions. There will be a five-year scientific review of this standard which includes installation of $PM_{2.5}$ monitors throughout the state to better define background concentrations and gather source specific information. U.S. EPA is expected to release a new dispersion model to better predict $PM_{2.5}$ concentrations. There is no assumed ratio of $PM_{2.5}$ to PM_{10} at this time. As more information becomes available, a more detailed analysis of $PM_{2.5}$ can be conducted.

Part D - Ozone Impact Analysis

Ozone formation tends to occur in hot, sunny weather when NOx and VOC emissions photochemically react to form ozone. Many factors such as light winds, hot temperatures and sunlight are necessary for higher ozone production. Since the maximum allowable VOC emissions are 12.7 tons per year (see Table 1) an ozone impact analysis was not performed for the Nucor Steel modification.

Part E - Analysis and Results of Source Impact on PSD Increment

Maximum allowable increases (PSD increments) are established by 326 IAC 2-2 for NO_2, SO_2 and

PM_{10}. This rule limits a source to no more than 80 percent of the available PSD increment to allow for future growth. Since the impacts for NO_2, SO_2 and PM_{10} from Nucor Steel were modeled above significant impact increments, a PSD increment analysis for the existing major sources in Montgomery County and its surrounding counties was required. The PSD minor source baseline dates in Montgomery County were established on October 1, 1992 for NO_2; May 29, 1994 for PM_{10}; and August 7, 1980 for SO_2. Therefore minor source modifications as well as major source modifications can consume PSD increment after these dates. All PSD sources in Montgomery County and surrounding counties from Nucor Steel were screened.

TABLE 5 - Prevention of Significant Deterioration Analysis (ug/m^3)

Pollutant	Year	Time-Averaging Period	Modeled Concentrations	PSD Increment	Impact on PSD Increments
NO_2	1990	Annual	14.25 [a]	25	57.0%
SO_2	1990	Highest 2nd high 3-hour	137.1	512.0	26.8%
SO_2	1992	Highest 2nd high 24-hour	52.1	91.0	57.3%
SO_2	1992	Annual	5.3	20.0	26.5%
PM_{10}	1990	Annual	5.6	17.0	32.9%

[a] Includes the NO_x/NO_2 ratio of 0.75 cited in 40 CFR 51, Appendix W Guideline on Air Quality Modeling.

326 IAC 2-2-6 describes the availability of PSD increment and maximum allowable increases as Aincreased emissions caused by the proposed major PSD source ... will not exceed 80% of the available maximum allowable increases over the baseline concentrations for sulfur dioxide, particulate matter and nitrogen dioxide...@. The baseline concentrations were determined from modeling the existing PSD sources that impact the Nucor Steel significant impact area. Table 5 shows the results of the PSD increment analysis for NO_2, SO_2, and PM_{10}. The PM_{10} 24-hour increment showed violations of the 80 percent of the PSD increment for PM_{10} (24-hour) and further modeling was required. The results of the PM_{10} increment analysis for the modification (strip caster plant) only showed the maximum predicted 24-hour impact was 4.9 ug/m^3 in 1994 (940826). The PSD increment consumption by all other PSD sources (except the Nucor modification) showed a maximum impact of 18.9 ug/m^3 in 1994 (940826) at the same receptor. This leaves an available increment of 11.1 ug/m^3 (30 ug/m^3 – 18.9 ug/m^3). The Nucor modification does not violate the 80 percent of the available increment rule for the modification source since the maximum impact was less than 80 percent of the available 24-hour PM_{10} increment (see Table 6 below).

TABLE 6 – Available Increment Analysis (ug/m^3)

Pollutant	Year	Time-Averaging Period	Modeled Modification Concentration	PSD Available Increment	Impact on PSD Increments
PM_{10}	1990	Highest 1st high 24-hour	4.9	11.1	44%

Part E - Hazardous Air Pollutant Analysis and Results

As part of the air quality analysis, OAM requests data concerning the emission of 188 Hazardous Air Pollutants (HAPs) listed in the 1990 Clean Air Act Amendments which are either carcinogenic or otherwise considered toxic. These substances are listed as air toxic compounds on the State of Indiana, Department of Environmental Management, Office of Air Management construction permit application Form Y. Since the total emissions from all HAPs are 0.379 lbs/hr or 1.66 tons/year, an air quality analysis for the

HAPs was not required but a modeling analysis for the HAPs was still performed. The results of the HAPs air quality analysis is shown in Table 7.

OAM performed toxic modeling using the ISCST3 model for all HAPs. Maximum 8-hour concentrations were determined and the concentrations were recorded as a percentage of each HAP Permissible Exposure Limit (PEL). The PELs were established by the Occupational Safety and Health Administration (OSHA) and represent a worker=s exposure to a pollutant over an 8-hour workday or a 40-hour workweek. In Table 7 below, the results of the HAP analysis with the emission rates, modeled concentrations and the percentages of the PEL for each HAPs are listed. All HAP concentrations were modeled below 0.5% of their respective PEL. The 0.5% of the PEL represents a safety factor of 200 taken into account when determining the health risk of the general population.

TABLE 7- Hazardous Air Pollutant Analysis

Hazardous Air Pollutants	Total HAP Emissions	Total HAP Emissions	Maximum 8-hour concentrations	PEL	Percent of PEL
	(lbs/hr)	(tons/yr)	(ug/m^3)	(ug/m^3)	(%)
Benzene	0.0183	0.00974	0.03929	3200.0	0.001228
Dichlorobenzene	0.000232	0.00102	0.000498	450000.0	0.0000001
Formadehyde	0.0371	0.07357	0.07965	930.0	0.008564
Hexane	0.347	1.52	0.74496	1800000.0	0.0000413
Naphthalene	0.0339	0.01506	0.07278	50000.0	0.0001455
Toluene	0.0085	0.00636	0.01825	750000.0	0.0000024
Xylene	0.00547	0.00243	0.01174	435000.0	0.0000026
Propylene	0.0495	0.02203	0.10627	240000.0	0.0000442
1,3 Butadiene	0.00075	0.00033	0.00161	2200000.0	$7.32x10^{-8}$
Acetaldehyde	0.0147	0.00654	0.03156	360000.0	0.0000087
Acrolein	0.00177	0.00079	0.00380	250.0	0.00152
Metallic Hazardous Air Pollutants					
Arsenic	0.0000387	0.00017	0.000083	10.0	0.000831
Beryllium	$2.32x10^{-6}$	0.00001	0.0000049	2.0	0.0002468
Cadmium	0.000212	0.00093	0.0004551	5.0	0.009103
Chromium	0.00027	0.00118	0.0005796	500.0	0.0001159
Cobalt	0.0000162	0.00007	0.0000347	100.0	0.0000347
Lead	0.0461	0.202	0.09897	50.0	0.1979
Manganese	0.0000733	0.00032	0.0001573	5000.0	0.0000031
Mercury	0.0000502	0.00022	0.0001077	100.0	0.0001077
Nickel	0.000405	0.00177	0.0008694	1000.0	0.00008694
Selenium	$4.63x10^{-6}$	0.00002	0.0000098	200.0	0.0000049

[a] No OSHA PEL for 8-hour exposure exists at this time

Part F - Additional Impact Analysis

PSD regulations require additional impact analysis be conducted to show that impacts associated with the facility would not adversely affect the surrounding area. The Nucor Steel PSD permit application provided an additional impact analysis performed by URS Corporation. This analysis included an impact on economic growth, soils, vegetation and visibility and is listed in Section 6.0 of their application.

Economic Growth and Impact of Construction Analysis

A construction workforce of 200 is expected and Nucor will employ up to 100 people selected from the local and regional area once the facility is operational. Secondary emissions are not expected to significantly impact the area as all roadways will be paved. Industrial and residential growth is predicted to have negligible impact in the area since it will be dispersed over a large area and new home construction is not expected to significantly increase. Any commercial growth, as a result of the proposed modification, will occur at a gradual rate and will be accounted for in the background concentration measurements from air quality monitors. A minimal number of support facilities will be needed. There will be no adverse impact in the area due to industrial, residential or commercial growth.

Soils Analysis

Secondary NAAQS limits were established to protect general welfare, which includes soils, vegetation, animals and crops. Soil types in Montgomery County are of the Miami-Crosby silt loams Associations (Soil Survey of Montgomery County, U.S. Department of Agriculture). The general landscape consists of Tipton Till Plain or flat terrain (1816-1966 Natural Features of Indiana - Indiana Academy of Science). According to the modeled concentrations of CO, NO_2, SO_2 and PM_{10} and the HAPs analysis, the soils will not be adversely affected by the proposed modification.

Vegetation Analysis

Due to the agricultural nature of the land, crops in the Montgomery County area consist mainly of corn, soybeans, wheat, hay and oats (1997 Agricultural Census for Montgomery County). The maximum modeled concentrations of the proposed modification for CO, NO_2, SO_2 and PM_{10} are well below the threshold limits necessary to have adverse impacts on surrounding vegetation such as autumn bent, nimblewill, barnyard grass, bishopscap and horsetail milkweed (Flora of Indiana - Charles Deam). Livestock in the county consist mainly of hogs, beef and milk cows and sheep (1997 Agricultural Census for Montgomery County) and will not be adversely impacted from Nucor. Trees in the area are mainly Beech, Maple, Oak and Hickory. These are hardy trees and due to the insignificant modeled concentrations, no significant adverse impacts are expected.

Federal and State Endangered Species Analysis

Federally endangered or threatened species as listed in the U.S. Fish and Wildlife Service , Division of Endangered Species for Indiana include 12 species of mussels, 4 species of birds, 2 species of bat and butterflies and 1 specie of snake. The mussels and birds listed are commonly found along major rivers and lakes while the bats are found near caves. The agricultural nature of the land overall has disturbed the habitats of the butterflies and snake and the proposed facility is not expected to impact the area further.

Federally endangered or threatened plants as listed in the U.S. Fish and Wildlife Service, Division of

Endangered Species for Indiana list two threatened and one endangered species of plants. The endangered plant is found along the sand dunes in northern Indiana while the two threatened species do not thrive on cultivated or grazing land. The proposed modification is not expected to impact the area further.

The state of Indiana=s list of endangered, special concern and extirpated nongame species, as listed in the Department of Natural Resources, Division of Fish and Wildlife, contains species of birds, amphibians, fish, mammals, mollusks and reptiles which may be found in the area of the Nucor Steel. However, the impacts are not expected to have any additional adverse effects on the habitats of the species than what has already occurred from the agricultural activity in the area.

Additional Analysis Conclusions

The nearest Class I area to Nucor is the Mammoth Cave National Park located approximately 410 km southwest in Kentucky. Operation of the modification will not adversely affect the visibility at this Class I area. The results of the additional impact analysis conclude the Nucor's proposed modification will have no adverse impact on economic growth, soils, vegetation, endangered or threatened species or visibility on any Class I area.